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MIDDLE EAR DISEASE IN ITS RELATIONSHIP TO THE CRANIAL CAVITY.*

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WITH ABSTRACTS OF FIVE CASES.

EXPLANATORY OF ILLUSTRATIONS

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In the entire human economy there is not a single cavity which occupies and is of such vital, relative importance to its neighboring structures as that of the middle ear. It bears such important relationship to all which lies about, hidden away as it is deep down in the firmest and hardest

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bone of the body, that oftimes it is the very thread from which suspends the sword of Damocles.

Disease in this region means not only deafness, noises in the head, discharge and dizziness, but, when not properly recognized and taken in hand, results in invasion of the cranial cavity and perhaps death. The very fact that it is a small cavity, not readily visible and tucked away in so strongly fortified position, that when disease runs riot within its walls it lays the entire adjacent territory open to infection and invasion, is sufficient reason why more study, more careful analysis and sober consideration should be given to any sign or symptom pertaining to the ear. Only a few years ago the profession was taught to disregard a chronic discharge from the ear, with the admonition that to check it would be dangerous, therefore to let it alone to take care of itself. This idea of the subject took its origin, presumably, from the fact that many cases attended by spontaneous cessation of the discharge became worse and died. As a result of this teaching the laity came to regard a running ear as a most natural state of affairs which, to interefere with or to check by any means, would tend only to complicate matters. Formerly patients had to be satisfied with such advice from their physician, because of an undeveloped state of the profession's knowledge, but the day of such ignorance and omission is past.

A patient suffering from a suppurative affection of the ear demands a more absolute statement as to his condition and is entitled to a clear exposition as to the real dangers he is living under. Any other advice stamps the advisor as a man of antiquated ideas, nonprogressive and of limited ability. Your patient is a more educated man than he was a few years ago, and if you, as his medical advisor, have not kept pace with the march of progress, he has. His taste for the mysteries of scientific subjects has been whetted by an ambitious secular press, by the teachings of the departments for scientific research opened up by our colleges and universities and by the natural evolution for more searching thought by an enlightened public.

It has very pertinently been said that "a man with purulent middle ear disease has a charge of dynamite at the

base of his brain, which is liable to explode at any time."[1] To confirm the truth of this statement, we have but to look over the various causes of brain infection and abscesses, when we notice that, next to trauma, ear disease is responsible for the greater number of such conditions. Nowadays, with our more perfect understanding of the pathology of these conditions and the thoroughness with which antisepsis and asepsis may be applied, we find it to the salvation of our patient to enter the cranial cavity with the same fearlessness that the surgeon enters the abdomen in cases of strangulated hernia, appendicitis and gunshot wounds. Our first and all time duty is to place every suppurating middle ear trouble on the list of serious diseases. And the longer it exists the more serious it becomes. When you have this fact thoroughly imbedded and firmly fixed within your mind, then you are in a position to recognize the symptoms resulting from its entrance into the cranial cavity, and not call it a case of typhoid fever, or tuberculosis, as is constantly being done. Cases have again and again been reported where sudden death has resulted and where the autopsy has demonstrated a brain abscess as the cause resulting from a chronic ear disease.

Middle ear disease is a much more common affection than is ever thought to be and occurs in many cases where it was never suspected. Especially is this true of infants and children. Ponfick, who performed 100 autopsies on children, found only nine normal ears. Of all the remaining cases only in ten had an ear trouble been diagnosed. The mortality rate from intra-cranial complication resulting from ear disease, as found in 9,000 autopsies from all causes by Newton Pitt at Guy's Hospital in London, was two-thirds of 1 per cent. or 57 cases. Gruber found, out of 40,000 autopsies, 232 cases. As to the age, sex and side of head where lesion appears, the different observers hold divers opinions. The male, on account of his greater liability to exposure, seems to be more often affected. The same reason may account for the more frequent occurrence in the young. But here must also be considered the undeveloped condition of many of the parts. The greater number of otitic intra-cranial complications result from the chronic variety; although the number following close upon acute cases is by no means small. Some au-

thorities seem to deny the truth of this statement. It is said that Von Bergmann is of the opinion that brain abscess never results from an acute otitis. My perusal of the literature does not seem to bear out this statement, for I find numerous such cases reported. Men, like Macewen, Koerner, Schwartze, Toynbee, Meyer, Jansen, Paul Koch, and others have observed like things.

Aside from the abscess condition, we may have a phlebitis, a meningitis, and the formation of a sinus thrombosis, singly or in combination, following the acute or the chronic form of otitis.

POINT OF ENTRANCE OF THE DISEASE INTO THE INTERIOR OF THE CRANIUM.

The particular site of entrance through which the invasion takes place is one of the most important matters connected with this subject. It often becomes the subject of greatest importance in seeking the exact locality of the complication; for, from the knowledge of this fact, one is saved a round-about way of operating. It not only helps us to more acurately locate our trouble, but facilitates differentiating between an abscess and sinus disease. As for instance, in case we have a necrosis involving the roof of the tympanum, we might expect as a consequence a phlebitis or thrombosis of the superior petrosal sinus, because this sinus courses along the roof of the middle ear. Under such circumstances we do not at first expect to find disease in the cerebellum. Where we can possibly exclude mastoid disease, the chances are, although not necessarily, that we have to do with trouble in the temporal region. In discussing the various avenues through which disease may enter the cranial cavity, we have but to look at the anatomic landmarks lying about the middle ear. And here, first of all, we would most naturally look along the lines where the various parts of the temporal bone articulate with one another. The petro-squamous and the squamo-mastoid sutures are the important ones. The former is distinctly seen along the superior aspect of the petrous bone. It is always present during childhood and oftentimes in the adult. Along its course is situated the petro-squamosal sinus. This sinus bears particular atten-

tion on account of the importance it plays in fetal life to the intra-cranial circulation. At this time, and before the formation of the jugular vein it acts as the carrier of all the intra-cranial venous blood. Its presence can very often be made out in the adult skull and in children it is almost always present.

Forming the roof of the middle ear we have a very thin lamina of bone, so thin that it is markedly transparent. It is called the tegmen tympani. This thin plate of bone forms at the same time part of the floor of the middle cerebral fossa, and in cases that at times occur, where it is deficient, we have a very ready means of entrance of the infection into the brain tissues; for in such cases nothing but the brain membranes and the mucous membrane lining the middle ear separate the two cavities. Necrosis of the roof of the middle ear is probably the most frequent means of diseases entering the skull cavity. Forming the floor of the middle ear is also a thin plate of bone which separates it from the jugular fossa, in which lies the internal jugular vein. The bone is perforated for the passage of the auricular branch of the vagus nerve, and is at times the site of dehiscences, as in J. A. Andrews' case,[2] where the bony floor had two large openings, the result of arrested development. In such a case the jugular vein would lie in direct contact with the mucous membrane of the tympanum.

Part of the anterior wall of the middle ear is formed by the carotid canal and the thin bone lying between these two cavities is perforated by minute openings for the passage of the tympanic branches of the sympathetic. Posteriorally lies the mastoid antrum and cells and the sigmoid sinus. Between the latter and the middle ear is direct vascular connection, as is also the case between the antrum and cells and the interior of the cranium by the mastoideo-petrosal canal carrying a vein to the superior petrosal sinus.

The facial canal, which courses through the tympanum along its superior posterior wall, is sometimes exposed, either in part or in its entirety.

The inner wall of the middle ear is formed by the outer plate of the petrous bone, containing the two large openings known as the oval and round windows. Hence the

tympanum is separated from the labyrinth only by the membranes covering these openings. The labyrinth has direct communication with the cranial cavity by way of the interior auditory canal. The aqueductus vestibuli also connects the interior of the skull with the labyrinth. From this study of the teritory surrounding the middle ear, with its numerous means of communication with the cranial cavity, in one instance by way of a blood channel, in another by way of a lymph or nerve channel and again via a suture or dehiscence, one readily sees with what ease the brain may be complicated in all suppurative forms of otitis media, and why every such case should be considered alone, cautioning your patient of the great danger to which he is subjecting himself by neglecting to have every effort exerted in removing the foci of infection that is lodged somewhere within the various crevices of his middle ear. Diseased and partly necrosed ossicles should be removed, as they interfere with proper drainage. All granulations should be curetted, and polypi snared. Masses of inspissated secretion and cholesteatomatous masses should both carefully be removed.

As to the best method to pursue in this direction, we will not discuss here, as that is not strictly within the province of this paper.

In order to more easily comprehend our subject we will discuss the complication under two main divisions: that of phlebitis and thrombosis and pus collections.

PHLEBITIS AND SINUS THROMBOSIS.

Inflammation or occlusion by clot formation of any one or more of the numerous veins and sinuses within the cranium may follow as a complication of acute or chronic suppuration within the middle ear.

In case necrosis of the bone involves only the roof of the middle ear, we may have, on account of its location here, a phlebitis or thrombosis of the superior pretrosal sinus. The superior petrosal sinus is the venous channel running along the angle formed by the superior and posterior surfaces of the petrous bone and connects on one end with the cavernous sinus and on the other with the lateral sinus. In its course it traverses the floor of the middle cerebral

fossa or that part forming the roof of the middle ear and antrum. As may be seen from its connection, this sinus may become secondarily involved from extension of a similar disease of the lateral or cavernous sinus. It may also become involved from an infection in the mastoid cells by traveling along the mastoideo-petrosal canal. On account of the very free communication between the lateral sinus and the mastoid antrum and cells by way of the mastoid veins, infection my easily follow this route.

The internal jugular vein may be the site of a phlebitis or thrombosis secondarily to such a condition existing in the lateral sinus. Primarily it may be affected by way of the small foramina in the floor of the middle ear, which transmits the auricular branch of the vagus nerve; or the floor of the tympanum may become necrosed and open directly into the jugular bulb containing the jugular vein; or again, there may be a natural deficiency in the bony floor of the tympanum and the exposed vein would very likely be open to an infection.

It might be appropriate here to mention that a necrosis may extend in such a direction that the case may terminate fatally from hemorrhage by a carious perforation of the carotid canal and ulceration into the carotid artery[3], [4], [5].

SYMPTOMS.

The symptoms of phlebitis and thrombosis of the cerebral vessels vary greatly with the particular sinus or sinuses involved. In common we have symptoms of pyemia; that is to say a sudden and high temperature, accompanied by rigors and perspiration and ultimately metastatic abscesses.

That all these symptoms necessarily exist in every case does not by any means follow. At times they are so insidious in their manifestation that they may escape detection. Some observers[6] think infective sinus thrombosis is more likely to occur where the streptococci are present in the purulent ear secretions than when the staphylococcus alone is there. In the differentiation between the location of the particular sinus, Schwartze[7] says thrombosis and phlebitis of the lateral sinus due to otitis media is diagnosed only when pyemic symptoms are present. Gerhardt

mentions a condition of lesser distention of the jugular vein on the side of the obstructed lateral sinus, but Schwartze has found the opposite condition.

Griesinger and many others believe a painful edema over the mastoid, as a symptom of lateral sinus thrombosis, due to the extension of the clot through the emissary vein, is diagnostic; but this must not be confounded with a swelling of the mastoid region accompanyning diseases of the mastoid cells.

If the thrombus in the lateral sinus extends downward to the internal jugular, we have swelling, edema and pain in the neck and face and often a distinct erysipelatous inflammation of the skin of the cheek and forehead. That a thrombosed condition of this vein may exist without producing the usual symptoms of a hard, cord-like feeling in the neck, pain and edema is a fact and is seen in a case reported by Eulenstein,[8] where the internal jugular was excised for a thrombus extending almost to the innominate.

In case the cavernous sinus is involved, we have some distinct symptoms and to favor a more comprehensive understanding of them we will but briefly make mention of a few anatomic facts. The vessels tributary to this sinus are, the 1, superior and inferior ophthalmic veins; 2, spheno-parietal sinus, arising from a meningéal vein; 3, central retinal vein; 4, inferior anterior cerebral vein.

In the case of the superior and inferior ophthalmic veins, these two vessels do not empty their main flow of blood into the cavernous sinus but into the facial veins; therefore thrombosis of the cavernous sinus does not necessarially very materially affect the orbital veins.

The central retinal vein communicates with the superior ophthalmic vein, but according to Henle, it often empties directly into the cavernous sinus. This is of importance and explains the Gräfes theory of "congestive papilla." But this theory is not always tenable, for in case of obstruction in the cavernous sinus, where the retinal vein empties into the superior ophthalmic vein, the blood may find an outlet through the facial vein, with which it communicates and hence, in such case, no marked congestion of the papilla would exist.

The cavernous sinus empties into the lateral sinus by

way of the superior petrosal sinus and into the internal jugular vein by way of the inferior petrosal and into the anterior vertebral plexus by way of the basilar plexus. (Virchow.)

. Aside from these main routes, it has other outlets in the form of minute veins communicating with the outside of the skull.

Lying within and passing through the cavernous sinus, we have the following structures: the internal carotid artery with its sympathetic plexus, the third, fourth, sixth and ophthalmic nerves. Pressure on the third nerve would cause a paralysis of the upper eyelid and a divergent squint; also rotation on its vertical axis would be prevented. In the very beginning the pressure symptom would cause a contracted pupil from irritation of the papillary fibres of the oculo-motor nerves. Later dilatation of the pupil would result, due to the paralysis from continual pressure. Irritation of the sixth nerve, which supplies the external rectus muscle of the eyeball, would cause the eye to rotate outward, while a paresis of the same nerve would cause the same to rotate inward. This nerve, as a rule, is affected earlier than the third nerve.

Irritation of the ophthalmic nerve gives rise to supra-orbital and frontal neuralgia. When the pain is local and confined to the course of the supra-orbital and frontal nerves, the source of irritation is in all likelyhood located in the cavernous sinus. But in case the pain is diffused over the entire half of the head, the pressure more likely comes from a meningitis, which involves the second as well as the third branch of the trigiminal nerve. The pain is accompanied by a hyperesthesia of the skin of the same region, which at the same time is warmer and redder. There are present other symptoms of irritation, like lacrymation and photophobia. Later on, when the pressure causes paresis of this nerve, we have a condition of anesthesia of the skin of the forehead, eyelids, ocular conjunctiva and anterior portion of the nose. The skin at the same time becomes pale in color and cool to the touch.

As a result of interference with circulation from the clot formation in the cavernous sinus, we have a damming back of the blood in the veins tributary to the sinus, causing an edema of the eyelids, conjunctiva, forehead and

nasal mucous membrane. This condition exists first only on one side but soon spreads to the opposite, owing to an extension of the clot to its neighboring sinus by way of the transverse and circular sinuses. This is well illustrated in the following case of mine:

H. K., 2 years, first seen by me Jan. 23rd, 1900, with an acute left-sided mastoiditis. Temperature 104. Had been complaining of ear since two weeks. There was no discharge. Advised an immediate operation, but parents refused consent. Ten days later, Feb. 2nd, I was hurriedly called for and found the little patient in a partially comatose condition. Rectal temperature 106. Had a dry, hot skin. Father said in the inverval of my seeing the child, scarlet fever had developed for which it had been treated by the family physician. The scarlatina rash and at places desquemation, were still present. Some signs of meningitis were evident, as shown by the contracted pupil, and the burrowing of the head in the pillow when disturbed. Great intumescence of the tissues above, anterior and posterior to the ear with induration in the neck. No ophthalmic examination was made. Father now implored me to operate. It was a hopeless undertaking, but I consented. At 4 p. m. of the same day I performed a tympano-mastoid operation. The tissues all about the ear were greatly infiltrated with pus. Coming to the cortex, a large sinus just over and leading directly to the antrum was found. The bone was well chiseled away in all directions. I could not, by careful search, discover any avenue of necrosis leading to the interior of the skull. The bone was soft and permeated with the pus. An ice pack was ordered on the head after the operation and kept there. The next day the morning temperature was 103° and afternoon down to $101^{2}/_{5}°$, with a pulse of 128. No delirium or convulsions. The third day the temperature went down to 101° but later up to 103° and fluctuated between these two points. There was some edema of the soft tissues about the left eye, which spread to the side of the head. This was accompanied by a restlessness, but no vomiting. A tremor of the hands became noticeable with slight attacks of convulsions. Marked induration of opposite side of neck with pain over the mastoid on this side was evident. On the fourth day the temperature

remained above 102,° not varying more than half a degree, but the pulse was up to 130. The edema on the left side was subsiding, but began to show about the right eye. A second operation was considered but the condition of the patient forbade it. The fifth day temperature went down to 100° but the pulse was so rapid and weak that it could not be counted. The edema now involved both eyes so as to close the lids entirely. Enormous induration along the course of the jugulars and extending away down the neck. The mastoid dressing was changed, wound looking good with little pus and no redness, soreness or pain on pressure. The right ear was now discharging and the mastoid very painful and swollen. I made a small exploratory incision on the right side of neck in search of a possible pus cavity, but found none. Sixth day temperature varied from 104° to 101.4.° Pulse 200. Patient restless as if in pain. The edema about the left eye now cleared up. He rapidly fell into a state of coma and exitus lethalis occurred the afternoon of the sixth day. No post mortem was allowed.

An almost identical case is one reported by J. W. Sterling.[9] His patient was 17 months old, having an acute otitis media occurring during an attack of scarlet fever. A mastoid inflammation complicated matters and was operated on and relieved. Three days following an edema of the left upper eyelid developed, increasing until it became impossible to examine the eyeball. One day later the right eyelid began to swell and continued as in the left lid. Two days following this the swelling of the left eyelid began to subside, the right following and on the fourth day the eyeball could again be seen. Three days after this death occurred. Post mortem examination revealed a thrombosis of the left superior petrosal, cavernous and circular sinuses.

Tinnitus and deafness may be symptoms of inferior petrosal sinus disease, on account of the labyrinth vein emptying into the sinus, which being obstructed, causes a congestion of the inner ear. Where the superior longitudinal sinus is involved in the process, there may be epistaxis, which is profuse and recurring, associated with epileptic symptoms, convulsions and at times unconsciousness.

PUS COLLECTIONS.

These may exist as,
1st, Extradural abscess,
2nd, Subdural abscess,
3rd, Cerebral abscess,
4th, Cerebellar abscess.

The condition known and spoken of as localized purulent meningitis is the same as extradural abscess. Here the infective process within the ear in its progress toward the brain, develops a mild type of meningitis about the point where the infection is to enter. The dura becomes cemented to the bone and as the infection enters the cranium it is nicely walled off and confined to the site of the meningitis.

Where the invading process is more rapid and there is no time for the dura to throw out sufficient inflammatory material to act as a barrier to the further progress of the condition, we have an entrance effected through the dura into the subdural space. Here possibly the brain membranes have marshalled sufficient force together to stay the progress of the advancing disease, by throwing up a similar intrenchment to confine the disease, as that attempted by the dura on the outside.

In case this is not successful, we have the infection entering the brain substance itself to form a cerebral or cerebellar abscess.

From this it is to be seen that pus may collect either external to the brain membranes, forming an extradural abscess, between the membranes, forming a subdural abscess, or inside of them, forming cerebral or cerebellar abscess. Any single one or a collection of these conditions may exist. It is estimated that 20 per cent. of the ectogenous cerebral abscesses are multiple. Knapp places the number at 4 per cent.

As to the location of the abscess, there is great variation. In case of necrosis its location may bear no relationship to the point of entrance of the disease. For instance, in necrosis through the roof of the middle ear into the middle brain fossa, there may result the formation of an abscess outside of or between the membranes of the brain. From this abscess, fistulae may lead to a point distant

from its entrance from the ear into the brain tissue. In exceptional cases, the brain lesion has been found upon the opposite side from the affected ear. Again, the abscess within the brain need show no communicating sinus between it and the neighboring dura mater and bone.

The majority of abscesses are of the medullary variety. It is the exception to find them in the grey matter.

Just to show the frequency of ear disease as a cause of brain abscess, I give you the statement of Von Bergman and Barker, who claim that one-half of all such abscesses are due to otorrhea. Meyer and Ogles' estimate of the same is placed at 30 per cent. Traumatism has generally been conceded to be the commonest cause of brain abscess; neglecting, to my thinking, in recognizing that the abscess condition is in some of these cases secondary to an ear trouble, lighted anew by the injury, and thus crediting the injury as the prime cause of the abscess.

In discussing the location of these abscesses, it interests us in particular to differentiate between the cerebral and cerebellar varieties. Were we to know the exact avenue by which the infection entered, matters would be simplified in many of our cases. And this is not always impossible. Absence of mastoid symptoms may not necessarily lead us to exclude the possibility of cerebellar disease.

In discussing the subject of various points of entrance of the disease, I mentioned the internal auditory canal and meatus as an avenue leading to cerebellar abscess, its opening being below the tentorium and within the posterior fossa. Two cases reported by Thos. Barr,[10] very beautifully illustrate this by showing on the specimen how the infection traveled from the middle ear, by way of the labyrinthine spaces and auditory and facial nerves to the posterior fossa and caused a cerebellar abscess.

In general, authorities agree that young children seldom suffer from cerebellar abscess, Koerner giving the cause as due to the greater distance of the posterior fossa from the ear. They occur most frequently between the ages of ten and thirty. Out of 177 cases of abscess of otitic origin, Koerner found 98 were in the cerebellum and 79 in the cerebrum, while of 57 cases of intracranial complications found in Pitt's 9,000 autopsis, 3 were abscessses of the cerebellum and 14 of the cerebrum.

Of the cerebral abscesses of otitic origin, the temporo-sphenoidal lobe is the most general location, while those in the cerebellum, in the main, are situated in one of the hemispheres and along the course of the sigmoid sinus.

SYMPTOMS.

To my mind the history of having had or still having purulent middle ear disease is symptomatic of, although in itself not sufficient to diagnose, abscess of the brain.

Any brain symptoms that may be present in an acute suppurating middle ear disease are usually so obscured by the more intense otitic ones that the congestion or mild inflammatory condition of the brain membranes may be overlooked, as all the attention of the patient is directed to the painful ear.

Hence, in the early, or so-called "forming stage" of the abscess, most of the symptoms escape us, or are interpreted as due to other conditions, and as a result it is not until the fully formed abscess is present that we realize the importance of our case, and in some instances not then, for such abscesses have been known to exist for years without causing any apprehension of their presence; so that during the forming or initial stage of the abscess the symptoms are either mistaken for some other condition or are overshadowed by the more acute ear pains. During the quiescent stage, which varies from days to months and in some few cases to years, there are of course no symptoms, and it is in the great majority of cases during the fulminating stage that the symptoms that I will now discuss are to be found. These remarks, of course, have reference to the chronic abscess. In the acute abscess we do not have a distinct capsule formed, as in the chronic variety, and as a general rule there is no period of quiescence.

Of the several symptoms to be mentioned, that of headache is the most common, not necessarily on account of its severity, for this varies a great deal, but more on account of its frequency. It occurred in two-thirds of all of Meyer's cases. According to Ladame, it occurs more commonly in abscess than in tumors. As a rule it is the earliest symptom we have and is usually located over the

site of the lesion, although this is not invariable, as it may be diffused, over the forehead or over the entire head.

The pain is not so acute in the initial stage; there remains only a general dullness of the same. This too is true of the hypersensitiveness about the head and particularly over the site of the lesion. Pressure and percussion on the skull will make the person wince, but the pain is not transmitted to the opposite side. This we noted as more common in sinus disease.

The state of mental hebetude is a somewhat prominent symptom. The mind seems not to work well for itself. Even when prodded on, as in conversation, there are marked evidences of a halted cerebration. The patient when spoken to seems to have his mind on something else and is looking with a vacant and dream-like expression into space. He responds to one's questions slowly and methodically, as if weighing every word, and when there is a lull in the conversation he may fall asleep. Macewen compares these symptoms somewhat to those of poisoning by opium.

Next to headache, Meyer found fever to be a prominent early symptom. It occurred in one-eighth of all his cases. But as just stated, the diagnosis of abscess, as a rule, is not made early in the disease, and hence the temperature at the time of recognizing the condition is more frequently found to be subnormal. The differences in temperature findings is very likely explained in the accompaning condition found early in the disease, the temperature being due to the accompaning phlebitis or meningeal congestion, or to acute suppurative process. Such is seen in a case of Ridley's[11] where a cerebellar abscess was found in a boy of 14 years with chronic otitis, presenting marked pyemic symptoms, temperature 99° to 105,° but with a slow pulse, respiration and cerebration. In uncomplicated cerebral abscesses the temperature is usually about normal or slightly subnormal, 97° to 99.°

Pulse and respiration are slow. The former is what is known as cerebral pulse, that is, slow and full and varying between 40 and 60 beats. The slowness of the pulse is due to the pressure exerted by the abscess, but is not always necessarily lowered in proportion as the abscess is large; for a large abscess may be accompanied by a sufficiently

large amount of brain disintegration, so as to lessen the amount of pressure exerted by the accumulated pus.

The respirations are also slow and regular, but at times may be of the Cheyne-Stokes type and especially is this likely to be true where the abscess is located in the cerebellum. The peculiarity in both the temperature and pulse is to be noted where the abscess is emptied. At first they immediately rise and then synchronously fall to the normal. As with temperature so with rigors. The earlier the case is seen, the more prominent is this symptom. Later on it is exceedingly uncertain in appearance and variable in degree.

Vomiting is another early symptom and is very frequently present, but becomes less so as the fully formed stage is reached. It is characteristic in that it is spontaneous, unaccompanied by nausea or retching. Obstinate constipation, especially in the otherwise regular, is, in connection with the other symptons, diagnostic.

Dizziness and vertigo on attempts to get up or move about much are oftentimes present.

The presence of convulsions and paralysis depends a great deal on the particular part of the brain involved, and hence if present may be symptomatic of the location of the abscess. Paralysis of the third cranial nerve would cause ptosis, strabismus and dilated pupil.

Examination of the eyes for the finding of changes in the fundus will, in many cases, prove positive, but it is not as constant a symptom in abscess as it is in tumor. To show the value of ophthalmoscopic examination in these cases, I refer you to the work done by Gradenigo, Delstanche and others who show that, in one-half of all cases of intra-cranial complications due to middle ear disease, we find lesions of the papilla.

Owing to the abscess being, as a rule, situated outside of the motor area, symptoms of localization are seldom present, although at times such may appear. In some cases of abscess of the temporo-spenoidal lobe, we may have a hemiplegia of the opposite side, involving the face, arm and leg. It may be partial or complete and occur in the reverse order.

Aphasia is another one of the less uncommon symptoms. If it is of the sensory type—word deafness—the abscess

would be located in the posterior part of the tempero-sphenoidal lobe; and if of the motor type, its location would be at the base of the third and ascending frontal convolutions.

In case the abscess is located in the cerebellum the head pains in the last stage are persistent and very often intense, and as a rule located at the occiput and nape of neck.

Vomiting is also more constant and uncontrollable than in temporal abscess. Koch[12] mentions as diagnostic the possibility of double-sided amaurosis as contrasted with temporal abscess, where this has never as yet been noted. Koch also mentions the presence of patellar reflex disturbance, more often decreased, as a symptom wanting in temporal abscess and at times present in cerebellar abscess.

Emaciation and loss of muscular strength are very noticeable symptoms, the cause of which may be found in the explanation of Luciani, who says that within the cerebellum reside the centres for the musculo-nervous apparatus.

Abscess of the occipital and frontal lobes as the result of ear disease is the exception and occurs only seldom, and then as the result of an infective embolism (Macewen).

DIFFERENTIAL DIAGNOSIS.

This phase of the subject is of the utmost importance to the operator. He has a variety of conditions to deal with, some of which require quite a different procedure in operating than others. The symptoms, of sinus thrombosis and abscess stand out in bold relief from one another and as individual conditions are not to be confounded, but where we have a combination of conditions, as very often occurs in cases of sinus thrombosis and cerebellar abscess, we may find ourselves with a very difficult problem to solve; but in just such a combination of conditions as mentioned, it matters not so much, as the route of operative procedure may be the same, that is, through the mastoid, via the sinus and on the posterior fossa. But when we come to differentiate between an abscess in the cerebrum and the cerebellum, it becomes a matter of much greater difficulty. The latter produces less marked local symptoms and hence is more difficult to diagnose than the former.

Luc declares the differential diagnosis between subdural abscess, meningitis and cerebral abscess to be difficult, and advises an exploratory operation consisting of a series of incisions, first through the dura, and, if no pus is found, then through the pia and then, if necessary, through the cerebral tissue. He condemns puncturing the membranes in an effort to locate a pus cavity in the brain, but instead advises going step-wise. This same advice seems applicable in cases where doubt arises between a phlebitis and thrombosis and a pus collection in the cerebellum. Although incising the membranes has its advantages they seem to be offset by the liability to hernia of the brain and its results. Puncturing of the dura before exploring the brain tissue may be done aseptically with a heated electrode.

At times we are called upon to differentiate between diffuse purulent meningitis and that of abscess and sinus disease. Often this very condition masks the forming stage of an abscess within the brain tissue. As a means of differentiating between such a condition of meningitis or that of brain abscess from sinus disease, examination of the cerebro-spinal fluid is at times employed. Leutert[13] and Quincke recommend the lumbar puncture, while Koch suggests puncture through the dura at the site of operation, as methods of procuring the fluid. Absence of polynuclear leucocytes, increase of fluid matter, clear fluid absence of micro-organism are negative signs. This method would seem of greater value in determining between a meningitis serosa and an abscess of the brain on account of the excess of fluid present, and by withdrawing some would materially relieve the symptoms and possibly cure the trouble. But as this condition so often accompanies that of abscess, little may be gained curative by such method.

Other varieties of meningeal trouble, like tuberculosis and a simple hyperemia, have often to be excluded. Both are usually confined to children. The tubercular meningitis is as a rule secondary to a tubercular affection in the ear or some other organ.

Tumors are at times to be considered in the diagnosis, but their very slow growth and the absence of ear disease are usually sufficient to exclude them. There is a growth

that complicates ear disease which was described by Balfour and called chloroma. It is a very rare and malignant disease and occurs in the young.

In case facial paralysis is present it may be important to differentiate between that of cortical and of peripheral origin. Macewen says that in the cortical kind the paralysis is not as complete and the sense of taste in the anterior two-thirds of the tongue remains intact.

As a means of diagnosis, percussion of the mastoid is being relied upon more and more nowadays. Authorities like Macewen and Koerner advocate and indorse it.

Just to show how a continued and overlooked cause of pyemic symptoms may occur, let me but briefly refer to a case of infected thrombosis of the sigmoid sinus belonging to C. Barck. Ligation of the jugular vein had been performed in order to limit the systemic infection, but on autopsy a large abscess containing two tablespoonfuls of pus was found situated in the posterior cervical triangle under the deep fascia of the neck, communicating directly with the sigmoid sinus by way of the mastoid foramen.

PROGNOSIS IN OTITIC BRAIN ABSCESS.

The course of the chronic abscess when not interferred with is death, due either to rupture in the ventricles of the brain or upon its surface, or from extensive edema or, in some cases, anemia of the brain. Kopke[14] in reviewing 141 cases operated on, found 40.4 per cent. were permanently cured. 26 were acute, showing 42.3 per cent cured, and the rest were chronic with 43.1 per cent. cured. He found cases with normal or subnormal temperature offering a better prognosis. In the acute variety, death is the usual termination when not interfered with surgically. It occurs anywhere between eight days and four to six weeks. A very rare exception to this is a case seen by me in consultation with Dr. Porter of Chicago. The very uniqueness of this case warrants the recital here.

R. W., $2^1/_2$ years, on the 26th of January, 1900, was suddenly taken ill with a convulsion. Temperature 104°, vomited once. A diagnosis of entero-colitis was made and he was put on small doses of calomel. The following day the temperature was 99·° No more convulsions or vom-

iting. From Jan. 29th to Feb. 5th the temperature ranged between $104^1/_2°$ and 99.° with rather sudden remissions. Patient very restless, Meningitis was suspected and a specialist on children's disease was called in and diagnosed tubercular meningitis. Its cause was looked for about the ear, but no evidence of any ear trouble could be made out by them. From the 5th to the 9th the temperature was between $97^2/_5°$ and $98^4/_5°$, pulse 116 to 88. Patient very restless unless under full dose of bromid. Inclination to throw head backward and arms over head frequently. From the 9th the temperature went gradually up until the afternoon of the 12th, when it reached 103.° Then it fell again to 100,° only to go up once more to 103° on the following day. The pulse became very weak and stimulants had to be used continually. He was now somnolent most of the time and without any bromid. On the 14th the temperature became subnormal and remained so for the next seven days. At this time the eyes were examined by an oculist but no fundus changes were found. On the 26th I saw the patient for the first time during his illness. I had seen him a year prior to this when suffering from an otitis media with pain over the left mastoid, but this subsided in two or three days. The little patient was emaciated to the extreme and as a consequence was weak and anemic. His right ear began discharging the day before and when I saw him was continuing so. The secretions were examined and found to contain only the streptococci and staphylococci. The left ear was dry but the drum membrane bulged slightly, showing fluid within the middle ear. The posterior superior walls of tho ear canals showed no sagging whatsoever. Both mastoid regions were sensitive to pressure but presented no redness or edema. Temperature at this time was $100^2/_5°$ and his speech was disturbed. The aphasia was of the ataxic variety. When spoken to his answers were long drawn out, in measured style and not entirely correct. Very often the wrong word was used. There was clearly a lack of coördination in the muscles concerned in speech production. Two days later the left ear began discharging and both ears continued to discharge profusely with a corresponding rapid improvement in the patient. One week later measles developed endangering the life of the already

exhausted little one, but fortunately he weathered this last trouble safely and when seen last by me only a few days ago, he was in the very best of health.

ABSTRACTS OF FIVE CASES EXPLANATORY OF ILLUSTRATIONS.

SPECIMEN I.—Case was an old man, seen in a state of typical basal meningitis, with paresis of some of the eye muscles; and no operation was performed, as the case had evidently progressed too far.

Specimen shows a carious destruction of tegmen tympani and antri, through which the suppurative process reached the meninges. Clinical diagnosis of diffuse suppurative basal meningitis was confirmed by post mortem examination.

SPECIMEN II.—F. F., age 15, seen March 15th, 1887. Otorrhea on left side for about 8 years, treated at intervals; headache from time to time. During the last six months the headache was more frequent and violent than before and, after cessation of discharge from ear, exceedingly severe for last 5 days; then dizziness, nausea and convulsions set in. When seen, patient had temperature of 104° to 105°, was delirious, half comatose, very restless and apparently suffering with severe pain in head.

External canal was filled with thick fetid pus; wall was so swollen that no speculum could be introduced. Mastoid region was thickened, edematous very tender. Diagnosis: Mastoid abscess with probably intra-cranial complications. Operation next day showed a large mastoid abscess and extensive caries. The discharge, both through the opening and the external canal, was profuse. For the next few days the patient seemed to improve; the headache disappeared almost completely, the fever went down to 100° to 102,° she became more conscious and answered questions. Then she got worse again, sank more and more into coma, paralysis of the right side set in and she died in a comatose condition on March 29th. Autopsy next morning: The skull was opened in the usual way; dura mater of convexity somewhat congested, but not more adherent to bone than usual. Veins all overfilled. On attempting to take brains out of skull, there was a gush of thick, yellow fetid matter which came out of an abscess

cavity in the left hemisphere. It had opened at a place opposite the posterior wall of the petrous bone and had been adherent to its periosteum quite firmly around the point of opening. Adhesions were found nowhere else. The whole dura mater was covered with pus, but the greater portion of it was evidently from the abscess. After the brain had been taken out, the whole temporal bone was removed by two uniting cuts.

The dura mater covering the tegmen tympani and the posterior surface of the petrous bone was thickened and of a dirty, greenish-black color. In the midst of this, over the aqueductus vestibuli, there was a small hole occluded by a protruding clot of thickened pus, which corresponded to the opening into the brain abscess. The temporal bone was then divided to show the tympanum, mastoid antrum and labyrinth. They were found united into one irregular cavity, partly filled with matter and detritus. A probe introduced into the wound appeared without difficulty in the middle ear. The malleus and thickened drum-membrane were *in situ*. The perforation of the latter was a relatively small one, in the anterior lower region. The whole tegmen tympani was carious, very thin and showed a number of small perforations, through which pus was escaping.

The abscess cavity in the left hemisphere was situated in the temporal lobe extending backward into the occipital lobe. It was almost as large as a goose egg, of an irregular oblong shape. There was a firm enclosing capsule of connective tissue. The opening at the above mentioned place was large enough to introduce a penholder, though it was in part of course, artificially made. The pus within the cavity was of the most offensive character so that it was nearly impossible to remove the smell from the head.

(Full report in Transactions of Mo. State Med. Assn. '87.)

SPECIMEN III.—Chronic otitis media, mastoid abscess and sigmoid sinus thrombosis. Evacuation of sinus and ligation of the jugular vein. Death from pyemia due to a deep-seated abscess in cervical region. Duration one month.

History:—John K., Hungarian by birth, 26 years old. Patient had, since childhood, left-sided otorrhea.

Patient first consulted me on January 15, 1894, because of pain in left ear for three or four days preceding. Right

ear normal. Left ear, foul smelling discharge in moderate quantity. The walls of the external canal were found to be somewhat swollen, the tympanic membrane gone and the middle ear completely filled with small polypi and granulation tissue. The region over the mastoid showed no swelling, but was somewhat tender on pressure. Temperature 100° F. Under local treatment he improved.

On February 17, I was called to see him at his residence. He was confined to bed, complaining of severe pain in the entire left side of the head. He had had chills and rigors for two days and had vomited two or three times. Temperature 100,° pulse 100. The region over the mastoid was somewhat swollen, and the tenderness on pressure was more pronounced.

Operation (Stacke's), February 18th.—Immediately after the removal of the external table, fetid pus was found. The antrum was exposed, and found filled with granulation tissue and pus. A portion of the posterior wall of the external canal was then removed, so that the canal, antrum and tympanum formed one large cavity from which the foul smelling pus and abundant granulation tissue were carefully removed. Only small portions of the ossicles remained. The tegmen tympani and antri was found healthy, but the bone in the region of the lateral sinus seemed somewhat discolered, so that I stated at the close of the operation, that if the symptoms did not subside rapidly, opening of the sinus would be indicated.

After the operation the patient felt relatively well and the temperature did not reach 100.° However, during the next two days it rose to between 103 and 105, the pulse varying between 80 and 112.

He complained of headache and had chills. There was no paresis nor any material change in the fundus of the eyes. The general condition and curve of temperature were typical for systemic pyemic infection. Therefore, I opened the lateral sinus, February 21, in its sigmoid portion from the cavity in the mastoid. An oblong piece of bone, (discolored as before described) nearly one inch long and one-third of inch wide was removed by careful chiselling and forceps. Some pus and granulations were found between it and the exposed wall of the sinus, which was also discolored. The sinus was then punctured with an exploring

needle and found thrombosed. An incision in its wall, as long as the opening in the bone was then made, and a large softened purulent thrombus removed. The cavity was then gently cleansed with a blunt spoon as far as practicable, first downward then upward. There was no hemorrhage from the lower and only a moderate one from the upper end. As soon as this appeared the sinus was closed by compressing its walls with antiseptic gauze and the hemorrhage easily checked.

Subsequent course.—The expectation of checking the further infection of the system was not realized. While on the next day he had no chills (temperature below 100), and felt some better, on the following day he became worse, the symptoms beginning with a chill. The temperature again rose to $104^{2}/_{5}$, pulse became frequent, pain appeared in different joints, and, in short, he presented for the next two days the typical picture of an even more serious pyemic infection.

The area over the jugular vein in the neck had been regularly examined since his entrance into the hospital, but it was never painful and no thickening nor stringiness indicating thrombosis of the jugular vein could ever be detected. For the continuance of the septic state there seemed to be but one explanation, viz., that the septic thrombus had already reached the bulb of the jugular, and had not been entirely removed. It was accordingly decided to litigate the jugular vein, an operation which was done by Dr. A. C. Bernays, on the 24th. The vein was filled with normal blood; no signs of thrombosis. It was ligated in two places and cut between the ligatures.

The ligation did not have the desired effect, as the pyemic state continued. Frequent and profuse perspiration, pain in the joints and high temperature weakened the patient more and more. He became delirious, then somnolent, and finally fell into deep coma, and exitus lethalis ensued on the 15th of March. The temperature during the last two weeks ranged between 101 and 105, pulse between 110 and 130.

The wound in the mastoid and sinus was throughout in the normal condition of an undisturbed healing process.

Post Mortem.—The skull was opened in the usual way. The contents did not present any pathologic appearance,

and the brain was intact. There was no leptomenngitis, nor any trace of pachymeningitis. The dura mater covering the temporal bone was perfectly normal throughout. The inner wall of the lateral sinus in its sigmoid portion was of normal appearance half transparent, so that the defect in the bone due to the operation could be plainly seen through it. Upward, in its horizontal portion, the sinus was closed for about one inch, its walls being soldered, as it were. Downward, in the end of the sigmoid portion, it was patent for about half an inch, but further down it was firmly soldered. The jugular vein between the bulbus and the ligature was filled with a healthy thrombus which showed no disintegration and which was without doubt the consequence of the ligature. No thrombus was present in any other of the dural sinuses. Thus far, the postmortem findings did not offer any explanation for the continuance of the pyemic state after the two operations and the conclusion arrived at at this time was that the infection had become too general to be overcome by obliteration of its foci. And it was rather accidentally, than otherwise, that the true cause was discovered. Owing to the pressure of time I did not at first intend to remove the temporal bone in order to preserve the specimen, but afterward decided on doing so, and during this procedure, after the big muscular layers on the posterior portion of the neck had been divided, we found a large abscess under the deep fascia of the neck below the splenius capitis and levator scapula in the posterior cervical triangle. The abscess contained about two tablespoonfuls of exceedingly fetid pus. The digastric fossa was free from pus.

About an inch and a half upward, direct communication could be traced between the abscess and the lateral sinus through a very large mastoid foramen. This abscess was without doubt the cause of the continued pyema and fatal termination. No symptoms pointed to its existence during life. No redness, no swelling, no pain in the region. There is no doubt that its recognition and surgical treatment would have saved the life of the patient. Not as an excuse, but simply as a matter of fact, I will state that the patient had been seen daily, not only by myself, but by the aforementioned surgeon, and also by one of the most

careful diagnosticians in our city. In spite of repeated consultations, the real focus of the pyemic infection was not discovered until the post mortem examination and even then was almost overlooked.

SPECIMEN IV.—G. R., Nov. 30, 1893, aet. 23, had influenza and pneumonia for about 3 weeks. In right ear had chronic otitis media before influenza set in. In consequence of latter, an otitis media developed in left ear also.

When seen in consultation patient had severe pain in right mastoid region and head. Mastoid region red, edematous. The upper and posterior wall of external auditory canal hung down and was swollen nearly occluding the lumen.

Next day I operated under narcosis and found the bone sclerosed exceedingly hard and dense. No pneumatic cavity was observed until the antrum was reached, where sinus was found; free communication with tympanum.

First two days patient did well. On Dec. 3, he had a chill and temperature rose to 103.5.° Next day fell to normal, patient felt well, was up until Dec. 10, then had a chill at 6 p. m., with temperature of $104^{2}/_{5}$,° profuse sweating.

The wound looked well the entire time; the sinus wall especially was found of such dense and healthy looking bone, that in consultation with Dr. S., a diagnosis of sinus thrombosis by continuity was deemed improbable. Under narcosis, the cavity was cureted again and the opening into the middle ear enlarged. Same evening there developed pain and swelling in the right shoulder joint. Next day, pain and swelling in right and left elbow joint, temperature 103.° Frequent chills and profuse sweating next day. Exitus lethalis on 15th.

Autopsy.—No thrombus in lateral sinus. Blood in it fluid, mixed with some minute particles of pus. Wound in the thinnest part 2 inches thick, dense, hard and healthy looking. The entire mastoid is of dense ivory like consistency but traversed by enlarged veins filled with pus. The autopsy showed that an opening of the sinus would not have saved the patient. It was clearly a case of "otitic pyemia, without sinus thrombosis."

SPECIMEN V.—J. S., colored. aet. 48. Otitis media and otorrhea since Christmas. For about 2 weeks swelling behind the ears.

Operation March 2, 1896. Large abscess and detritus in mastoid reaching into antrum. For one week regular healing course. On 28th chill and vomiting, headache; confined to bed. Suspicion of sinus thrombosis but no fever, pulse 72. Proved to be gastritis after eating too many tomatoes; had similar attack of indigestion before. Suppuration from ear ceased in third week. Dismissed on April 14 with wound closed.

Next day returned with a benumbed sensorium, and stated that he had been unable to pass urine for 24 hours. Catheterization yielded on a small quantity of urine.

Sent to City Hospital, where he was comatose. Pulse 72, temperature $104^1/_2$.° Differential diagnosis between menia and cerebral affection left open. Operation proposed for next day. Patient fully conscious, temperature 99,° pulse 72. Complained only of headache; in support therefore operation was performed. During the next few days, patient could not be seen regularly for essential reasons. He fell again more and more into coma, with temperature 101 to 103,° was very low on 20th. I operated, reopening the wound and found the mastoid filled out with healthy tissue wall against sinus being firm and hard. It was therefore not exposed, I trephined in the cerebellar region. Some dirty lymph and small amount of pus was found inside of the dura. Patient died without regaining consciousness on April 20th.

Post Mortem.—Diffuse cerebro-spinal meningitis. Infiltration of pia thickest on right side upon frontal lobe and below cerebellum and medulla oblongati. Dura covering temporal bone entirely intact. Sinus operated, contained fresh blood clot.

Temporal bone removed, shows the entire tip of the petrous pyramid destroyed by tuborcular caries; Cochlear and semicircular canals wanting. Remnant surfaces covered with cheesy masses and tubercular nodules.

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XXVII.

REPORT OF A CASE OF ULCERATIVE LARYNGITIS, SIMULATING TUBERCULOSIS WHICH PROMPTLY YIELDED TO MERCURIAL TREATMENT.

By Samuel Kohn, M. D.,

NEW YORK.

This case is reported, as an illustration of the advisability, in cases of ulcerative laryngitis, of doubtful diagnosis, of placing the patient under a mild course of mercurials, even though a history of syphilis be entirely wanting. The patient presented signs and symptoms, strongly suggestive of tubercular infection; the mercury was administered with the idea of clearing up the diagnosis, and, as will be seen, this course was followed by a rapid and permanent cure.

The history of the case is as follows:

B. L., male, aet. 30 years, born in Russia, 28 years in the United States, married five months, family history good.

Previous History,—Eight years ago, had gonorhea of five weeks duration, complicated by "swollen testicle," for which he saw a doctor four times; denies ever having had a secondary eruption, and never had, so far as he knows, any of the sequelae of the initial lesion of syphilis. I thought of an intra-urethral chancre, which might possibly have complicated his so-called gonorrhea, but the absence of all sequelae of such an infection thereafter, negatived the idea.

He was then perfectly well up to January, 1900, when he suffered from the "grip," which he declares kept him in the bed for two days; four or five days thereafter, suffered a relapse, attended by severe sore throat, which, from his description of his symptoms, I judge to have been an acute catarrhal laryngitis; by February, 1900, the patient was perfectly well.

Six weeks before calling upon me, i. e., the middle of May, 1900, he commenced to suffer from pain in the larynx; irritation causing cough; some dysphagia.

He placed himself under the care of a general practitioner who examined his throat and treated him conscienciously for six weeks, with no other result than to produce an aggregation of all his troublesome symptoms.

On the 29th of June, 1900, I saw him for the first time; the young man was poorly nourished; almost cachetic; emaciated to a degree; although his normal weight was about 125 pound, he had been reduced to 110 pounds during the six weeks of his illness.

Voice rhancous, almost gone, complete aphonia being a question of only a few days; complained of intense dysphagia, the blandest articles of food, even water, producing intense agony when swallowed; the act of deglutition is painful in itself; the ingestion of food, either solid or liquid, causes a suffocative cough so irritating and painful as to make each meal a painful and laborious undertaking. The cough, hacking, constant, not severe, unattended by expectoration, evidently due to laryngeal irritation. Temperature was 100° F.; pulse, small, weak, 90. General condition, miserable. Examination of the chest: while certain areas presented signs of a suspicious character, I concluded not to attach too much importance to them, until I had observed the patient for a week.

The sputum was not sufficient in quantity to imperatively demand a microscopic examination, for which I had no facilities, as the patient was being treated in a country place.

Examination of the larynx revealed an ulceration in the pyriform sinus on either side, of the size of a pea, margins sharply defined, the base of the ulcers being covered by a layer of pus and detritus; destruction of tissue not very deep; similar ulcers, exist in the valleculae, but not quite so large or deep as those in the pyriform sinuses; the upper margin of the epiglottis thickened to about double the normal, studded with superficial ulcerations; ventricular bands slightly swollen, reddened but not very deeply, show scattered superficial ulcerations; the edges of the vocal bands, which are deeply congested, are ragged and present small superficial ulcers; the arytenoids,

slightly edematous, present on their superior surfaces small superficial ulcers. The introitus laryngis is narrowed by the swelling of all the parts.

With this picture before me and with the previous history as above given, the diagnosis certainly seemed to lean to tuberculosis; emaciation, hacking cough, almost complete aphonia, intense dysphagia, ulcerative laryngitis, the duration and history of the disease, favored this view.

The local conditions in the larynx which caused me to doubt the tubercular nature of the ulcerative process, were, the symmetry of the ulcerations, their sharply defined edges, the comparatively small amount of tissue destruction, the absence of adventitious tissues in the larynx, the absence of marked edema, and the deeply congested condition present.

With the idea, therefore, that syphilis might have had some latent influence in the production of illness I put the patient on $^1/_8$ grain pills of the protiodid of mercury, every four hours during the day, and insufflated iodoform powder into the larynx daily.

This treatment by mercury, I adopted, as much for the purposes of diagnosis as a means of treatment.

The third day, the acuteness of the pain in swallowing was somewhat less; the ulcers assumed a cleaner and healthier appearance; the dose of the protoiodid was now doubled, the patient receiving $^1/_4$ grain four times a day; insufflation of iodoform biweekly; improvement in the condition continuous and progressive, so that at the end of two weeks the patient partook of solid food without pain in deglutition.

During the third week of treatment, the patient received $^3/_8$ of a grain of protoiodid four times a day and, as by the twenty-second day of treatment the ulcerations had completely healed and the patient had no complaint to make, I stopped the mercury and put the patient upon a course of iron and bitter tonics. One month after his first visit, he had regained his normal weight, his cough had ceased entirely, and as he stated "he never felt better in his life."

It would seem to be a harmless and possibly a very valuable aid in the treatment of all ulcerative conditions in the larynx, tubercular or nontubercular to put the

patient on a mild mercurial treatment at the outset; the syphilitic element in the infection, attenuated perhaps through generations may play a powerful role in patients, who positively have never themselves suffered from venereal disease. In such a case mercury will certainly exercise a beneficial effect, for besides its specific antiluetic properties, we know from the experiments of Keyes, that small doses of mercury have a remarkable quality of increasing the number of red blood corpuscles, and the percentage of hemoglobin.

For diagnosis as well as for treatment, the writer advocates the administration of small doses of protoiodid of mercury in all cases of ulcerative laryngitis, where it is not directly contraindicated.

815 MADISON AVENUE,

XXVIII

ON THE CORRECTION OF OLD TRAUMATIC DEPRESSIONS OF THE NOSE BY SUBCUTANEOUS PLASTIC OPERATION.

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The object of the following paper is to report the operative measures employed in two cases of nasal deformity, characterized respectively by traumatic depression of the cartilaginous bridge and by traumatic depression of nasal bones.

Although similar operations have been reported, notably by J. O. Roe, yet the details of the technique have not been stated with sufficient fullness to enable one to work from the descriptions.

As seen in the photographs both of the writer's cases* were adapted for the insertion of an artificial bridge of celluloid or metal. In view, however, of the liability of these artificial supports to come away, the attempt was made to fill up the depressed area by the subcutaneous insertion of cartilage or bone taken from adjacent parts which could be spared without detriment to the patient.

Case I. *Depression from septal abscess corrected by elevating a portion of the triangular cartilage.*

A man, about 25 years of age, came to the clinic, exhibiting an abruptly rounded depression of the nasal bridge at the middle of the superior outline of the triangular cartilage. The tip of the nose was of normal shape and the nasal bones were in their normal position (Fig. 1). Examination of the interior of the nose showed a defi-

*I am indebted to Dr. J. P. Clark, in whose service at the Massachusetts General Hospital these cases occurred, for kindly referring them to me.

ciency of the triangular cartilage on its upper border at a point corresponding to the external depression, with firm adherence to it of the mucous membrane and the overlying skin. The condition was evidently the result of an old septal abscess occurring near the superior border of the triangular cartilage, with resultant necrosis of the cartilage at the site of the abscess and consequent depression of the bridge immediately above. The patient stated that

Fig. 1. Photograph from Plaster Cast of Nose Taken Before Operation.

he had fallen about a year previously, striking the nose. Nasal occlusion immediately came on, lasting for a number of days and clearing up after the sudden discharge of matter from the nose. Depression over the injured area then began to form and in a few weeks attained the appearance presented at the time of his coming to the hospital.

The operation consisted essentially in cutting out a quadrangular piece of septal cartilage and lifting it upward

subcutaneously until the external depression was filled out. Under cocain and suprarenal extract, an incision was made through the triangular cartilage about one centimeter in front of its articulation with the perpendicular plate of the ethmoid and parallel to it, extending from the skin above to the vomer below. A second incision parallel to the first was then made through the cartilage about one centimeter behind the tip of the nose. The

Fig. 2. Photograph from Plaster Cast of Nose Taken Six Weeks After Operation.

inferior extremities of the incisions were next connected by a third, running parallel to the upper border of the vomer. A flap of cartilage was thus produced adherent only above to the mucous membrane and fascia corresponding to the external depression. On sliding the flap upward and forward in its own plane the skin of the depressed area was lifted up and simultaneously a rectangular perforation of the septum was created at the lower border of the flap. The anterior and posterior ends

of the flap were still in contact with the septum although at a point higher up than that which they formerly touched. After being elevated to produce a nearly straight superior outline of the nose, the transported flap was held in position by gold plated pins thrust through it and the adjacent septum on each side in an anteroposterior direction.

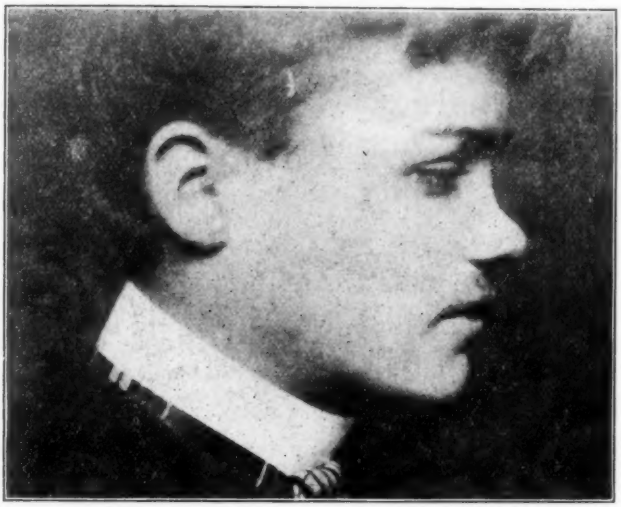

Fig. 3. Before Operation.

The reaction was slight, and after three weeks, the parts were sufficiently firm to permit removal of the pins. A few weeks later the plaster cast shown in Fig. 2 was taken. The bridge was firm and the patient had no discomfort from the perforation.

CASE II. *Correction of deformity from an old depressed fracture of the nasal bones by subcutaneous implantation of a septal spur.*

A young man, 17 years old, came to the clinic with the history of having been struck violently several weeks before on the nose. The nasal bones had been symmetrically depressed by fracture along their lines of union with the frontal and maxillary bones and were firmly fixed. Examination of the interior of the nose showed the triangular cartilage to be essentially normal except for a long

spur on the right side at its junction with the vomer. Under ether the spur was sawed from below upward, but so as to leave the mucous membrane of its superior surface intact. A slender knife was then introduced into the right nasal passage and a broad sweeping incision made between the upper surface of the nasal bones and the overlying skin, thus forming a subcutaneous chamber between these structures. The spur was then rolled upward, still adherent by its mucous membrane to the septum, and after some further loosening of the membrane to afford the necessary slack, was carried into the

Fig. 4. Photograph Taken Eight Months After Operation.

chamber prepared for it. The skin of the bridge was thus lifted from the nasal bones by the spur. After some external manipulation the spur was held in position by a thread passed through its mucous membrane from one side of the nose to the other. An external splint was also adjusted to aid in holding the transplanted bone in position. There was slight local reaction and almost no constitutional disturbance. After ten days the spur was found sufficiently firm to permit removal of the stitch and splint. The subsequent healing was uneventful. The photograph,

Fig. 4, taken eight months after the operation, shows the condition at the present time. The spur can be felt beneath the skin firmly fixed in the middle line in the subcutaneous fascia. It is capable of slight lateral motion on firm pressure. The intra-nasal condition is essentially normal, except for a broad cicatricial band on the right high up in the roof, near the anterior end of the nasal bone, indicating the spot where the spur was introduced into the subcutaneous chamber. There is no disturbance of nasal breathing or of olfaction.

XXIX.

A CASE OF PERSISTENT LARYNGEAL OBSTRUCTION IN A CHILD.

By Samuel E. Allen, M. D.,

CINCINNATI, O.

On the afternoon of Friday, April 6, 1900, the writer was summoned by the physician in charge to perform intubation. On arriving at the house the patient was found to be a fine, well nourished infant of between nine and ten months and weighing twenty-three pounds. There was well marked dyspnea and considerable cyanosis. The smallest tube in the O'Dwyer set was immediately introduced, giving relief to the threatening symptoms. On inquiry it was learned that the child had been ill since the previous Sunday with a cold and symptoms of influenza and not until Friday morning had there been any difficulty in breathing. There had been nothing in the pharynx and the repeated bacteriologic tests now made failed to reveal any Loeffler bacilli. To be certain, however, on Saturday 2000 units of antitoxin was given.

Sunday, April 8th, the patient developed a deep seated bronchitis, probably with some broncho-pneumonia. Oxygen was administered during the night and the two following days, when the threatening pulmonary symptoms subsided.

On April 10th, the tube was removed. The difficulty in breathing was very marked and the tube had to be reinserted at once. April 12th, another removal was undertaken but the dyspnea was even greater than after the firs removal, and the tube was immediately reinserted.

After one other unsuccessful removal it was decided to leave the tube alone for a few days, during which time the child did fairly well. Feeding was difficult but was carried on with the head of the child thrown back over a pillow and the milk dropped into the mouth with a medicine dropper. This position of the head seemed to clear the tube somewhat and was therefore assumed a good part

of the time. Removal was again tried on the 16th, but it seemed as if no air at all could pass through the larynx. Reinsertion was extremely difficult, owing to the soft, flabby condition of the parts, and the child nearly died before the tube was finally replaced. Reinsertion before this time had been easy. On the 21st a little swelling was noticed in anterior portion of the neck below the larynx. This swelling increased up to the 23rd and swallowing also became much more difficult. On the afternoon of April 23rd, 17 days after intubation, tracheotomy was performed. The patient was chloroformed, the intubation tube being still in position. The incision into the swollen tissues of the neck evacuated an ounce or more of putrid pus. A few bubbles of air escaped showing that the abscess had some slight connection with the lumen of the trachea. Before the pus was entirely wiped away the patient coughed up the intubation tube and the respirations stopped. The opening into the trachea had to be made as expeditiously as possible and after the insertion of the tracheotomy tube, artificial respiration quickly restored the patient. From this time on the patient did nicely. Feeding was easy and every thing progressed favorably. The larynx, however, remained occluded, not the slightest breath passing through the glottis.

Laryngeal inspection was not satisfactory owing to the age of the patient. The momentary glimpses obtained showed a hyperæmic and swollen condition of the mucous membrane. Oils injected into larynx flowed out through the tracheal opening and this intra-laryngeal treatment was kept up for a month or more. Early in June the patient for the first time was able to get a little air through larynx. Breathing with the tracheal tube corked now became free until the latter part of June when the patient was attacked by a severe intestinal catarrh, causing marked emaciation. July 5th the patient was removed to Michigan where the laryngeal obstruction gradually subsided and on July 17th the tube was finally removed. Since this date there has been no trouble at all with respiration.

The interesting points in this case are: 1. A positive diagnosis of the trouble was impossible, everything pointing, however, to a simple catarrhal inflammation followed

by chronic subglottic edema. How much the intubation tube had to do with helping to keep up the swelling it is impossible to say. It is absolutely certain that the case was not one of diphtheria. Neither bacilli nor membrane could ever be discovered.

2. The damage done by the tube to the anterior tracheal wall and the formation of the extra tracheal abscess. This I believe was due to the position the head assumed for so long a time, the end of the tube causing pressure atrophy and perforation of the anterior wall and permitting the secondary infection of the tissues in front.

3. The length of time of wearing the two tubes, the intubation tube for 17 days and the tracheal tube for 12 weeks.

4. The disappearance of the laryngeel obstruction with the onset of the severe intestinal trouble and emaciation.

After the first week or so following the tracheotomy, as the obstruction did not disappear, it became a question as to where the obstruction was located, whether in the trachea at upper margin of the tube, due to granulations or sinking in of tracheal walls, or in the larynx itself. To solve the problem, almost the entire convex portion of the outer tube was cut out, and, after taking out the inner tube, the posterior wall of trachea and the upper margin of the incision into it could be easily inspected by reflected light. A probe could easily be passed upward toward the larynx. In this way an accurate determination of the absence of obstruction near the tracheal wound could be made.

The permanent removal of the tube was of course a problem always confronting us. Naturally before this could be done we were obliged to determine *positively* whether the child could breathe freely without its aid. As soon as slight respiration through the larynx became possible, the inner tube would be withdrawn and the outer one corked, thus forcing natural respiration. At first the tube could be closed but a few minutes, but this time we were gradually able to lengthen until, when the emaciation from the enteritis became marked, the cork could easily be left from 6 to 12 hours. Still the respiration was not perfectly free and at the end of the time the removal of the cork was a relief to the patient. It was therefore not con-

sidered safe to remove the tube and let the wound close.

For the sake of safety a method of what might be called slow removal was instituted. A very short, nearly straight tube was obtained and inserted. This tube was of such a length that it just extended to the tracheal wound, and could be plugged without obstructing respiration through the larynx. With this tube the breathing practice was continued until we were finally rewarded by having the patient go 36 hours breathing naturally. Had any dyspnea arisen the ordinary tube could easily have been inserted and no harm been done. In fact in the first experiment of the kind this had to be done. The patient having gone 36 hours without trouble, the tapes holding the tube were loosened and its expulsion left to nature. In a few hours the tube was found to be nearly outside of the wound and it was taken away, the opening into the trachea having already closed. The entire wound cicatrized rapidly and there has been no trouble with respiration since.

22 West Seventh Street.

XXX.

A CASE OF EPIDERMOID CANCER OF THE SOFT PALATE.

CAROLUS M. COBB, M. D.

BOSTON, MASS.

Thomas C., aged 44, a laborer born in Ireland, was referred to me September 15, 1899, by Dr. Mangan of Lynn, Mass. He had always enjoyed good health until about three weeks ago, at which time he first noticed some trouble with his throat. Thinking it was an ordinary sore throat, he did nothing for it at first, but as it did not improve in what he considered a sufficient length of time, he consulted Dr. Mangan, who referred him to me. So far as he knew, his family history was good, none of his relatives had ever suffered with any throat trouble or had any malignant disease, nor had he himself ever before had any trouble with his throat. His only complaint was of pain on swallowing; he had not lost flesh, and did not consider himself sick, being able to work every day.

On examination of the throat, a growth was found which involved the whole of the right half of the soft palate, circular in shape, and extended from nearly the center of the soft palate outward so as to include the whole of the right anterior faucial pillar. There was also a small growth on the right side of the base of the tongue, a little more than a centimeter in diameter. The growth on the soft palate was raised, especially at the edges, being in some places a centimeter above the surrounding healthy tissue and was beginning to ulcerate at the center. Scattered around the outer part of the growth were a considerable number of spots, dirty black in color and about the size of the head of an ordinary pin. Under the overhanging edge of the growth were a few larger ones. The nose, naso-pharynx, pharynx and larynx were apparently free from disease and the cervical glands were not enlarged.

Believing the growth to be malignant, I removed several sections from different parts of it and sent them to Dr.

Wright, the pathologist of the Massachusetts General Hospital, for microscopic examination. He reported that the sections sent him showed the growth to be an epidermoid cancer. I saw the patient at various times during the next four months, but I never succeeded in convincing him of the necessity of a radical operation for the removal of the growth, and in the light of the subsequent history of the case, I am not at all sure but that he lived as long without operation as he would have done if the growth had been removed, for while the cervical glands were not apparently enlarged during the first three months he was under observation, they finally became enlarged and would undoubtedly have been found to be infected had he been operated upon as soon as the diagnosis was made.

I did not see the patient between January, 1900 and the 28th of the following August, at which time I was called to his home, and found him emaciated to the last degree almost totally deaf, and so hoarse that he could not speak above a whisper. The soft palate, anterior faucial pillar, and the tonsil of the right side had entirely ulcerated away; there was a deep excavation on the right side of the base of the tongue, the epiglottis was nearly destroyed and the false cords were invaded and partially destroyed. I could not see the true cords to determine if they were affected. The growth had also extended upward to the naso-pharynx and had involved the Eustachian tubes. The patient lived two days after I saw him, and died of asthenia. No autopsy was permitted.

An interesting point about this case is that the growth gave the patient so little trouble, for it is reasonable to suppose that it had existed for some time before he began to complain of pain on swallowing, and that he only noticed the dysphagia after the growth had begun to ulcerate. He continued to do manual labor until within five months of his death, and gave up his work then only on account of general weakness due in part to his inability to take sufficient nourishment. In the way of local treatment, an application of lactic acid was made to the ulcerated surface at such times as I saw him and this seemed to have a favorable influence over the ulceration.

419 Boylston Street.

XXXI.

PAPILLOMA OF THE VOCAL CORDS—A REPORT OF FIVE CASES.*

By Dr. W. L. Bullard.

COLUMBUS, GA.

It is said by experienced laryngologists that papillomatous growths are more frequently found in the larynx than any other laryngeal neoplasm. Schnitzler[1] says this is especially so in children. Schrötter places its proportion at eighteen per cent., while Moure[2] agrees with Elsberg, Fauval, Bruns and others, in saying that it occurs in about fifty per cent. Mackenzie heads the list and puts it as high as sixty-seven per cent.

As a preliminary to the clinical report of my five cases I will quote from the Archives of Laryngology 1883, Vol. iv, p. 244, five cases reported by Dr. H. A. Johnson[3]. In his first case the patient died from suffocation at the end of ten weeks. In his second, a child sixteen months old, suffering with hoarseness and dyspnea from birth, expelled a papillomatous growth in a paroxysm of whooping-cough resulting apparently in a complete cure. In his third case, tracheotomy was done at the end of three years, and thyrotomy at the end of four years, the child finally dying of pneumonia. In his fourth case, a papillomatous growth in a child necessitated tracheotomy, and death resulted the following day. The fifth case was very similar, the child also dying the day following tracheotomy, the larynx being found to be filled with papillomatous growths. Mention of the above cases is only to show what a different result can now be had since the introduction of the anesthetic properties of cocain.

My first case, white child, five years old, was brought to me nine years ago. Father of the child said the boy could not sleep with any satisfaction, either to himself or parents. His breathing when awake was sterterous and

*Read before the Tri-State Medical Association of Georgia, Alabama and Tennessee, at Chattanooga Oct. 1900.

during sleep extremely so; he would cease to breathe, at which time patient had to be aroused, so as to catch its breath. The boy could not speak above a whisper. A laryngoscopic examination revealed a multiple papiloma of the ventricular band completely filling the vestibule of the larynx. I advised surgical interference. Father had no objection to this but could not remain in town just then, so he asked for medical treatment until his return, which would be three weeks. At that time, as well as now, I knew of no specific for cases of this kind, yet, I prescribed thuja occident. fld. ext. and syrup of the iodid of iron. On patient's return as expected I could see no beneficial change, so after cocainzing the throat and larynx with a twenty per cent. solution of cocain I readily removed the entire mass with a snare. The voice was instantly restored, though somewhat hoarse, but in a few weeks the patient seemed to be perfectly well, and so far has had no recurrence of the growth.

Case second, Mr. C. D., aged 48, consulted me three years ago. Could not speak above a whisper. Was extremely nervous and considerably emaciated. He was under the impression that he had consumption for which he had been treated. At the time of consultation he was taking cod liver oil. With the laryngoscope the real trouble was revealed. On the middle third of the right vocal cord, was a small papillóma the size of a pea. My friend, Dr. Ralcy Halsted Bell, of St. Louis, saw the case with me, and with his kind help I cocainized the throat and larynx, and readily snared off the growth. The relief was instantaneous and most wonderful. Articulation was immediately restored, which seemed to both frighten and delight the patient. He had not spoken aloud in so long that his voice appeared to astonish him. After disabusing the mind of my patient of all fear from having tuberculosis I prescribed as a stomahic, tincture of nux vomica. He returned home very much elated, and has until now had no return of the trouble. His age caused me to have some anxiety concerning the malignancy and a recurrence of the neoplasm, but I am glad to say that such was groundless.

Case III. Mrs. W. P., white, age 35, consulted me fourteen months ago. She was aphonic could not speak

above a whisper, and had considerable cough. The breathing was not impeded, yet she looked very much debilitated and worried. Had been told that she had bronchitis with a tendency to consumption. (I don't know by whom this wisdom was unfolded, whether by a follower of Esculapius or one of Job's comforters). This patient also had follicular or granulated lids and appeared to be predisposed to catarrh. An examination with the laryngoscope revealed a raspberry-like growth—a papilloma on the upper third of the left vocal cord. Removal of the growth was accomplished without much difficulty, performed endo-laryngeally after thorough cocanization of the pharynx and larynx. The voice was instantly restored to the gratification of the patient. She continued to improve and in a few weeks had regained her normal condition, which she retained up to a few months back, when she again presented herself with a cough and inability to articulate above a rasping whisper. On examination with the laryngoscope, a small papilloma the size of a pea was readily seen attached to the anterior portion of the right vocal cord preventing close approximation of the cords. The pharynx and larynx was cocainized with a twenty per cent. solution cocain muriate and with the snare the neoplasm was readily removed by the aid of the laryngoscope. As before the voice was instantly restored and in a few days the patient went on a visit to the mountains of North Carolina, and on her return home seemed to have regained her former health and, at the present time, has no evidence of any return of the growth.

Case IV. A negro child, male, four years old. Had been troubled for several months prior to coming to me, which was three months ago. I found the child with labored breathing and aphonic. Breathing could be heard all over the room. Sleep was greatly interfered with on account of labored inspiration. Child was frightened hence I had some trouble in making a laryngoscopic examination, though this was successfully done, revealing a multiple papiloma of the left cord or ventricle, filling the supraglottic laryngeal cavity. After thoroughly cocainizing the throat and larynx and quieting the child as much as possible, with the assistance of the child's father I easily extirpated the entire neoplasm with the snare. In

this case there was some undue hemorrhage, which caused me to imagine that I had attacked an angioma instead of a papillomatous growth. The blood flow soon ceased and microscopic examination of the pathologic specimen convinced me that it was a papilloma. The voice was instantly restored, but remained somewat hoarse and rough. In a week's time the voice had asssumed it normal resonance.

I could add to this report a number of other cases, which might be of interest, but the above perhaps are sufficient to convey the motive for which this paper is presented and, in closing it, I beg to announce that whenever I undertake to do a capital or an extreme delicate endolaryngeal operation I have no hesitancy in extending my most sincere gratitude to the memory of Signor Garcia, a teacher of music in London, for the introduction of the laryngoscope and a Turck of Vienna and Czermak of Pesth for its introduction to the profession and last, but not least, to Carl Koller, formerly of Vienna, now of New York City, for giving to the world one of the grandest endowments ever offered by man—the anesthetic uses of cocain.

[1]Klinisher Atlas der Laryngologie.
[2]Lecons sur les maladies du Larynx.
[3]Bosworth, Diseases of the Nose and Throat.

XXXII.

THE SURGICAL TREATMENT OF OTIC SCLEROSIS.*

By Dr. Ricardo Botey.

BARCELONA.

TRANSLATED

By Albert Miller M. D.

ST. LOUIS.

For a long time I have been convinced that otic sclerosis is a tropho-neurosis. Its lesions are usually distributed in a capricious manner and rarely localized to the middle ear alone. As a rule disorders of the tympanum coincide with troubles in the labyrinth, the mastoid cells, the antrum, and sometimes even the nasal and rhinopharyngeal mucous membrane or bone.

The concomitant lesions are often slight but the nutritive trouble always exists, the atrophy of the epithelial, nervous and glandular elements is undeniable in spite of its insignificant and deceiving appearance and in spite of the fact that our methods of otoscopic and functional examination cannot prove that this tropho-neurosis has passed the limits of the tympanum to invade the labyrinthine capsule, even when the alterations have already seriously attacked the neuro-epithelial terminations of the auditory nerve.

In other words, I think that dry hyperplastic otitis or sclerosis of the ear is a panotitis which involves variously or chooses certain regions of the middle and internal ear according to pathologic hazzards, and, though there may often exist former alterations of the tympanum and capsule, these lesions do not attack the main path of the sound-waves (ossicles, fenestra ovalis and rotunda),

*"Annales des maladies de l'oreille, du larynx, du nez, et du pharynx," August, 1900.

when the terminations of the auditory nerve exist, so to say, in a latent state.

Further, it is hardly necessary to say that I am not partial to surgical treatment for otic sclerosis.

Nevertheless, I have frequently tried to cure or ameliorate deafness due to dry otitis by means of various surgical proceedings used of late.

I have employed the following: (a) Perforation of the tympanum. (b) Mobilization of the stirrup. (c) Extraction of the hammer, anvil and tympanic membrane. (d) Deep mobilization of the stirrup after cutting its adhesions to the border of the fenestra ovalis. (e) Ablation of the stirrup.

It is necessary, in order to intervene with any chance of success, that the various tests of audition demonstrate the integrity of the labyrinth.

The watch, in contact with the cranial wall, should be perceived over the mastoid, the temporal and the zygomatic regions, the Weber sign lateralized to the deafer ear and the Rinné sign negative. Perforation of the tympanum should always ameliorate, however little the hearing may be. When these four conditions are present operation may be done, especially if audition has diminished to four centimeters for the watch and the whispered voice.

(A.) *Perforation of the tympanum.* If this little operation is for a diagnostic purpose I accomplish it with a pearl of chromic acid melted in the alcohol flame at the end of a stylet. In a few minutes perforation is attained. There is no need of preliminary cocain anesthesia. Only, if, after application of the caustic to the postero-inferior part of the tympanum, the patient complains of a lively smarting I place upon the membrane a bit of cotton saturated with a concentrated solution of cocain and the pain disappears almost instantly.

I have practiced perforation of the tympanum eight times in dry otitis; I have recourse to it when the canal is narrow and tortuous and in the extraction of diseased ossicles. The operative proceeding is almost that of Miot; it consists in removing the membrane completely and cutting off the handle of the hammer below the external apophysis. In spite of the most rigorous antisepsis I have

frequently observed suppuration of the lips of the tympanum which lasts for several weeks. The perforation narrows and membranous bridges form after cessation of the discharge.

At length, that is to say in about two years, the deafness is about the same as before operation. In two cases, it was even aggravated. In six other patients I obtained an improvement of a few centimeters with the watch and a few decimeters for the whispered voice, but after one year the patients were dissatisfied for they could hear little better than before operation.

(B.) *Mobilization of the stirrup.* I have performed this operation twenty-two times in dry otitis and more than fifty times in cases of adhesions, retraction, ankyloses and synechia following suppuration of the tympanum. In the latter cases, I have nearly always observed improvement in audition. In three cases instant improvement was considerable; the perforation was enormous and the stirrup visible within; I had to break some marginal adhesions and the patients at once heard the whispered voice at four to five metres and the watch at 50 centimeters.

Unfortunately in the cases of dry otitis the improvement was only transitory; even after re-operating I have had only deceptive results.

It follows then, from my experience, that mobilization of the stirrup in dry otitis is a bad operation. I have not used it for a long time in auricular sclerosis, for the traumatic stimulus occasions the migration of a certain quantity of embryonic elements which, spreading into the meshes of connective tissue and between the epithelial elements organize later on into adult connective tissue, which, added to the existing sclerosis, render the situation worse, the patient becoming in a year and a half deafer than before operation.

But I still often practice mobilization of the stirrup in cases of fixation of this ossicle following suppurative otitis media, especially in favorable cases. The results are very superior to those obtained in dry otitis, but sometimes it is necessary to intervene early and the patient remains almost as deaf as before, for it is sometimes impossible to break up all the adhesions of the stirrup and

the new connective tissue formation nullifies all our efforts.

(C.) *Extraction of the hammer, anvil and tympanic membrane.* I find it no advantage to do, like Garnault and Malherbe, Stacke's operation in order to remove the tympanum and the ossicles. I have had no experience in extraction of the hammer, anvil and tympanum by perforaring the mastoid and removing the posterior-superior wall of the auditory canal.

When the canal is large it is always possible to remove the tympanum and the first two ossicles without preliminary osteotomy, thus making a simple harmless operation. Besides, as Dr. E. J. Moure affirms, "In the movement of extracting the hammer and anvil there is no doubt that the stirrup is mobilized sufficiently to improve the hearing of the patient."

But, after this indirect mobilization, the revival of the connective tissve hyperplasia ultimately aggravates the situation just as in the case of simple mobilization of the stirrup cited above.

It is useless to extract through the canal, a more or less extensive position of the attic wall to excise the hammer and anvil or to mobilize the stirrup in any case.

Chloroforming is likewise superfluous for these little operations.

For several months I have used for local anesthesia the following formula, exploited by Dr. Albert A. Gray, of Glasgow:

Alcohol - -	10	Grams
Anilin oil - -	10	"
Cocain hydrochlorate	2	"

With this solution complete anesthesia is obtained even when the tympanic membrane is inflamed.

I will not describe the technique which I employ, but will add that, if antisepsis has been careful, at the end of four or five weeks cicatrization is perfect without suppuration. Unfortunately there often sets in a sero-purulent discharge which produces thickenings and irregular circular bands which envelop the postero-superior part of the tympanum, that is to say, in the neighborhood of the oval window, and the branches of the stirrup, masking it in such a way that it is almost impossible to find it and

mobilize it again. The nodular tissue which covers the region must be cut blindly, and the stirrup may be loosened or one of its branches broken if extreme care be not taken. Furthermore, there is formed about the tympanum a new membrane usually thinner and more adherent to the promontory which it is necessary to remove two, three, or even four times subsequently within a few months.

The patients often lose patience and finally refuse to submit to new operations which, as they are repeated, become more and more painful.

As to the results I have obtained, here is an abridged summary.

Out of ten cases of extraction of the tympanum, hammer and anvil, I had permanent improvement of the hearing in but one case and that was only slight. In another case (a man of 55) where audition had diminished to one centimeter for the watch and eight centimeters for the whispered voice, the patient became completely deaf after the operation. It must be admitted that there was produced a vestibular, perhaps cochlear, hemorhage which destroyed the neuro-epithelial terminations of the auditory nerve.

The hemorrhage was probably provoked by the luxation and perhaps by the driving in of the base of the stirrup into the vestibule's interior, in course of the attempts at extraction of the anvil, the incudo-stapedal articulation being more firm than usual.

With my patients, at the end of six to ten months, the improvement of three to seven centimeters for the watch and ten to thirty centimeters for the whispered voice disappeared.

The results which I obtained in the last eight cases were mediocre, or else I had an unfortunate series.

D. *Deep mobilization of the stirrup after cutting adhesions to the border of the fenestra ovalis.* This operation is generally possible only after preliminary resection of a portion of the external attic wall. I always do this preliminary intervention through the canal and under local anesthesia.

Naturally, it is necessary that the patient be not too sensitive, for the operation, when the canal is large, with

Mounier's instrument, is rather painful and I have often been obliged to postpone the operation after removing two or three lamellae of bone, the patient falling in a faint.

Further, bleeding interferes much with operations on the branches of the stirrup and I often take two sittings. This method is fatiguing both to patient and physician, but I was able once to do it without preliminary section of the attic wall by cutting off the handle of the hammer and ablating the tympanum, introducing my small intratympanic mirror shown in 1890 at the Congress of Berlin. I was then able to make out the situation of stirrup and with the little bayonet-shaped knives, shown at the same Congress, I incised circularly the tissues which surrounded the stirrup to its base.

The result obtained in the latter cases was eleven centimeters for the watch and fifty centimeters for the whispered voice, the patient hearing the watch in contact with, and the voice two centimeters from the ear before operation. But, at the end of two months, the patient was almost as deaf as before the operation.

In the other cases operated upon with resection of the attic wall through the canal the result was insignificant and almost *nil* in two cases.

(E.) *Extraction of the stirrup and other ossicles.* I have for a long time hesitated before doing this operation the results of which gave little encouragement at last. Recently, I decided to undertake it in a patient with an old sclerosis with a calcareous tympanum, who could only hear whispered voice at the meatus, the Rinné being negative, and the watch heard over the mastoid. The result was absolutely negative though I extracted the stirrup without breaking any of its branches or damaging the attic wall,

I think, then, that Politzer has reason to deny the value of extracting the stirrup, the same as its mobilization. According to the Vienna Professor the fixation of the stirrup results from the formation in the membranous labyrinth of serous tissue which reaches the stirrup, the ablation of which would not prevent obliteration of the fenestra ovalis.

I conceived great hopes from this operation during my experiments upon animals in 1890, experiments which

were the subject of a long report to the Berlin Congress. To-day, notwithstanding my early optimism, I recommend this intervention only with extreme reserve, and only when the fixation of the ossicle is caused by cicatrices or adhesions following suppuration of the tympanum, when it can be effected without danger, the labyrinth and its capsule being unharmed in these cases.

Then, in ankylosis of the stirrup following dry otitis, the results are various and more often nil two years after the the operation, for the state of the fenestra rotunda and labyrinth are not known during the life of ths patient.

It does not appear proven to me that the only patients who would benefit by ablation of the tympanum and ossicles are those in whom the Rinné test is negative, which according to Behrens proves that the affection is limited strictly to the middle ear. This fact is perhaps often true but in other patients audition is much impaired and perforation of the tympanum gives no improvement, and if the tympanum and first two ossicles be ablated the result is insignificant, which proves that the tropho-neurosis has passed beyond the confines of the tympanum.

My statistics are absolutely discouraging for the results obtained in sclerosis of the middle ear are at best only mediocre, often insignificant and eventually almost always negative. Besides, it may happen that the operation aggravates the deafness considerably. Perhaps later on, when the indications are more precise and the technique perfected, better results will be obtained; but just at present it is not necessary to make any exception save for the consequences of middle ear disease.

Always, given a bad prognosis for dry otitis abandoned to itself, extraction of the tympanum and ossicles may be attempted but without making any predictions, for there may exist more profound lesions and the operation may determine later a proliferating nodular new-formation, as I said in 1890 at the Berlin Congress. In fact I expressed myself then, apropos, to my experiments upon animals, thus:

Often, when the irritation of the periosteum of the promontory, which surrounds the fenestra ovalis, is not severe, the fenestra ovalis only narrows more or less, leaving sometimes a very small opening through which

barely passes the small shank of the stirrup. Then it always happens that the base of the stirrup, situated more deeply, ossifies completely, increases greatly in thickness and welds itself completely to the real fenestra ovalis. This would explain the mechanism of certain ankyloses of the stirrup in man without assuming a special disease, but simply by a further extension of the periosteal inflammation of the stirrup base and borders of the fenestra ovalis in interstitial catarrhs of the mucous membrane.

Finally, the results announced by most authors are nearly all observed some weeks or months after operation. As the traumatism produces congestion with serous and embryonal transudation which gives flexibility to the tissues for some time and consequently facilitates movement at the articulations of the ossicles, it would be necessary to wait two years. I am persuaded that then nearly all patients affected with dry otitis and so-called cures by operation will hear less or no better than before operation.

In the course of my anatomic researches on the extraction of the stirrup in animals (1890), Puncture of the fenestra ovalis (1896 and 1897), and latterly on the absence of valves in the tympanum (1899), I have often examined the anditory organs of the cadavers of individuals past fifty; the young subjects were reserved by the students for disarticulation and study of osteology. The cadavers were taken at hazard and it was impossible to learn, with plainly sclerotic and adhesive lesions of the tympanum, if the individual thus affected had been more or less deaf in that ear. As in Spain there does not exist a single clinical ear hospital where autopsies can be made, the anatomo-pathologic study of otic sclerosis is almost impossible from the point of view of symptoms during life.

As otic sclerosis is common enough from 40 to 60 years and the lesions of the middle ear which it produces easily recognizable, I was able to remark that every time I found traces of chronic interstitial inflamation of the middle-ear mucuos membrane, with ankylosis, of the stirrup and formation of membranous strings in the middle ear, the labyrinth and principally the external wall of the

vestibule were always simultaneously affected with the same trophic troubles. In one case where the lesions, of the middle ear were insignificant, (a subject of 60 or 70 years) I remarked that the vestibule and the first portion of the cochlear canal were considerably affected with hyperostosis, the base of the stirrup forming a jutting promontory in the interior of the labyrinth enclosed by a projection formed by the ossified annular ligament, and the orifice of the cochlear canal being transformed into a narrow opening.

In another anatomic specimen the fenestra rotunda was indicated by a small hole with a hard bottom, the membrane of that opening being completely absent. It goes without saying that in that specimen there existed traces of sclerosis of the middle ear.

In a third preparation where the stirrup was firmly ankylosed by calcareous infiltration of the annular ligament and adhesions of the crura of that ossicle around about the border of the hyperostosed fenestra ovalis; the interior of the cochlea was somewhat narrowed by a new formation of spongy osseous tissue distributed irregularly.

Finally, in a fourth decalcified specimen, horizontal sections across the capsule of the labyrinth showed the following:

Interior of the vestibule narrowed in every direction by hyperostosis of its walls; ampullae of the semicircular canals flattened irreglarly; horizontal canal engorged at its peripheral extremity and a portion of the cochlea near the vestibule filled, in the space between the cochlear canal and vestibular canal, with connective tissue in the form of numerous slender filaments, partly calcified.

As I did not make a serious anatomic study of the question I only saw a few other cases where the lesions were less accentuated. I believe myself sufficiently informed, although I have only been able to study the pathologic anatomy of labyrinthine lesions of otic sclerosis in a summary way. I came to the conclusion that dry otitis is a chronic, interstitial, inflammatory lesion, nearly always a panotitis, of a trapho-neurotic nature, and that sometime the lesions are more extensive in the labyrinth than in the middle ear.

These lesions, as Prof. Politzer has said, have their

principal seat in the vestibule on the internal aspect of the fenestra ovalis and spread slowly from there toward the tympanum, the cochlear canal and semi-circular canals in a very capricious and irregular manner and operation upon the tympanum is ually superfluous. I will finish with the following conclusions:

1. In dry otitis, in order to have the right to try surgical treatment in spite of its almost constant inefficacy, it is necessary that cranial perception of the watch be preserved, the Rinné negative, the Weber lateralized to the diseased side and that perforation of the tympanum ameliorate, however little, the audition.

2. When the canal is large, permanent perforation of the tympanum may be done, but although sometimes a slight audition improvement is obtained, at the end of two years even supposing that the adhesions have been destroyed, the patient becomes as deaf as before operation

3. Mobilization of the stirrup in dry otitis is a completely useless operation for the improvement obtained is always transitory. This operation is only justified in the sequelae of suppuration and, even in these cases, the amelioration obtained after breaking up the adhesions of the stirrup, is not great nor lasting.

4. Extraction of the hammer, anvil and membrane can be done perfectly through the canal when the latter is large. The results obtained are mediocre or insigficant in dry otitis. The remote effects are almost negative; and a considerable aggravation of the deafness may follow.

5. Deep mobilization of the stirrup may be done without Stacke's operation. It is sufficient to remove through the canal a portion of the attic-wall. In dry otitis the results from this operation are usually slight and rarely permanent.

6. Extraction of the stirrup, in spite of great hopes conceived, is a bad operation. The results in dry otitis are almost nil.

7. For the surgical treatment of dry otitis, modern otology has moved in the wrong direction, for, as it is probably a tropho-neurosis and the lesions are usually panotitic, all means employed to modify the organs of emissions of sound-waves toward the labyrinth, cannot prevent the latter, which is almost constantly involved, from becoming more and more affected.

8. The experiments on animals which I have attempted are not all applicable to man, for in animals the labyrinth is intact and, in similar cases in man, it is almost always more or less affected, notwithstanding the fact that our means of investigation, still imperfect, cannot always demonstrate it.

9. The same experiments made by me upon animals in 1890 and repeated in 1896, prove the inefficacy of surgical treatment in otic sclerosis, since, by irritating the margin of the fenestra ovalis, the base of the stirrup ossifies completely, welds itself to the fenestra ovalis and the latter is narrowed by thickening and ossification of its border, due to the dissemmination of the interstitial mucous inflammation.

10. Since it is almost certain that otic sclerosis is a tropho-neurosis, with formation of connective and osseous tissue, principally in the labyrinthine capsule, round about the fenestra ovalis, in the cochlear canal and even in the helices of the cochlea, the neuro-epithelial terminations of the auditory nerve being more or less involved, surgical treatment of sclerosis of the ear is in nearly all cases useless.

XXXIII.

THE PATHOLOGY, DIAGNOSIS, SPECIAL PROPHYLAXIS AND TREATMENT OF TUBERCULOSIS OF THE MIDDLE EAR.*

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In the comparatively small space of the cavum tympani, rendered still less by the ossicles and numerous reduplications of the lining mucosa, the extension of tuberculosis to the antrum and adjacent cavities is facilitated to the highest extent. In the majority of cases the infective material is carried to the middle ear by way of the Eustachian tube. The resultant primary morbid changes are characterized by the development of the tubercles in the mucous membrane.

When the tubercles are limited in number and scattered, the intervening tissue is apparently normal, while should they be confluent, the area between the cell aggregations is obliterated, or is composed of granulation tissue insufficiently supplied with nutrient vessels, and there develops an inflammatory fibrous hyperplasia of a low grade. Under these circumstances the mucosa is but slightly mammillated and presents the appearance of a compact, uniformly diseased surface. Primarily the tuberculous nodule, as seen on the promontory or in the immediate vicinity of the tubal opening, is red in color and slightly elevated above the surface. The mucous membrane is pale gray from leucocyte infiltration.

As the pathological changes enumerated are usually not productive of symptoms sufficient to attract the attention of the patient, the otologist rarely sees the infection in this

*Presented in a Symposium on Tuberculosis at the Seventeenth Annual Meeting of the New York State Medical Association, October 17th, 1900.

stage, unless the tympanic membrane is also involved and there is a coincident myringitis. When this occurs, the drum head still remaining intact, there develop the small millet-seed projections not differing from those of miliary tuberculosis in other organs. Kretchmann has found the membrane studded with miliary tubercles, which ulcerate early and produce the more or less characteristic sieve-like perforations seen in this disease. In three cases I have observed isolated tubercles break down, and but one or two perforations resulted, but more frequently, and especially when the disease is consecutive to pulmonary tuberculosis, caseation is rapid and the drum head is destroyed in its entirety. When otorrhea is first noticed by the patient the infected tissues have begun to break down, and yellowish, opaque areas of cheesy degeneration are seen scattered over the promontory.

Unlike simple granulation tissue, there is a constant tendency to retrogressive changes and the newly formed tissue occupying the tympanic area shows no tendency in the majority of cases toward cicatrization, but the development ceases at the fibroplastic stage, the nutrition, always feeble, is rendered more so, and degeneration accompanied by secondary infection with pus organisms is a constant feature. It should also be taken into consideration that ulceration of the mucous surfaces inevitably occurs from the breaking down and disintegration of the tuberculous mass and then the base and edges of the ulcer are also carious. Invasion of adjacent tissues is highly probable, the infection spreading from the original area into the surrounding structures; at the same time the central focus disintegrates, as in a case reported by Haenel, in which tuberculous caries of the bone was followed by rupture of both abyrinthine windows, illustrating the centrifugal extension of the limited tympanic infection is a case recorded by Piffl in which there were secondary growths extending from the middle ear into the cranial cavity. The mastoid cells were replaced by a mass of tuberculous tissue, the ossicles were destroyed, the anvil was lying loose in the granulation tissue, and the bulb o the jugular vein was thrombotic.

The membrana tympani may become studded with tubercles which later undergo caseation, or it may present

localized areas of hyperemia with a moderate degree of round cell infiltration, most marked in the posterior superior quadrant. Following this condition, which, however, may remain stationary for a considerable period, the regenerative power is lost and the membrane rapidly melts away. Scheibe saw six cases in which this feature was well marked, the affection being characterized by extensive destruction of the tympanic membrane. Again, the drum may appear normal or but slightly clouded until late in the disease, in these cases the infection remaining for a long time localized at the promontory or near the tubal opening, or, as pointed out by Winkler, there may be an old perforation, due to a non-specific otorrhea, through which the parts become infected by the tubercle bacilli.

The ossicles, especially the malleus and incus, are usually subjected to the brunt of the disease and in my experience, it is not infrequent to have them exfoliated in the latter stages. But recently, I saw a case of grave pulmonary phthisis in which the right tympanum was extensively involved and the patient found the entire ossicular chain adhering to the pledget of cotton which he had been using to remove the discharge. While the tuberculous inflammation of necessity involves the bony boundaries of the tympanic cavity, the ossicles become necrosed before this occurs and are occasionally found in the detritus. The stapes is not so frequently affected as the malleus and incus, but in the latter stages even the foot-plate of the stirrup may become disintegrated, thus opening an avenue of infection by which the inner ear may become involved. Liaras reports a case in which the stapes was freed from the oval window, while Schutz in one case found the tympanum completely filled with small gray tubercles which had dislocated the ossicles and the new growth had extended into the external canal. Instead of necrosis, as shown by Bezold, there may be hyperplasia of the foot-plate of the stapes, and the hearing is greatly impaired when this occurs.

When necrosis of the bony walls takes place, the promontory is usually the first point involved and the process extends to other points of the osseous tissue, tubercular changes taking place in the facial nerve and, as pointed out by Randall, the destruction may be so great as to in-

volve the carotid artery and cause death by hemorrhage, seven deaths having been reported from this cause. The necrosis upon the inner wall of the tympanum may readily be detected both by visual examination and with the probe, but in a class of cases to which Kretchmann has called attention, it resembles to a marked degree a mass of fibrinous deposit, under which is denuded bone usually surrounded by granulation tissue.

The diagnosis of aural tuberculosis is of serious import, as upon the early recognition of the disease will depend to a great extent the future issue of the case. It seems best to study this aspect of the subject under three headings: First, the recognition of aural tuberculosis in a subject without general evidences of the disease, but in whom for obvious causes the middle ear affection is suspected to be of a tuberculous nature; secondly, the recognition in an individual suffering from pulmonary tuberculosis of involvement of the middle ear and, under this same heading, the diagnosis of the cause of otorrhea existing before the pulmonary affection developed. In the third class we have the differential diagnosis of a tuberculous otorrhea from that occurring in conjunction with syphilis, lupus, diabetes, and new growths.

In the first class of patients referred to, there is usually a slight watery discharge from one ear, which has existed for several months, appearing without the knowledge of the patient and, at no time, has there been the slightest evidence of pain. Physical examination of the respiratory organs shows nothing suspicious; the patient may be of good physique, but usually is of somewhat under weight and anaemic and, in addition, he will give a history of pulmonary tuberculosis in near or distant blood relatives. The hearing is but slightly impaired and on examination the membrana tympani will present several small perforations, round in contour, with the edges thick and everted and instead of the congested appearance seen in ordinary otorrhea, the drum membrane will be of a blue white color, presenting somewhat the appearance of ground glass, with the addition of an oedematous element. Under these circumstances the insidious development of the discharge and the absence of pain strong emphasis being placed upon this point by Oaks, who says that, although the

otorrhea is of recent date, if there is no pain or other manifest symptoms except the discharge, a tuberculous etiology is suggested should immediately direct the attention of the otologist to the nature of the case. The importance of a prompt diagnosis in the incipiency of the disease cannot be emphasized too strongly, as these are the cases that present the most favorable outlooks as regards treatment.

Of the greatest importance and the crucial factor in the diagnosis of tuberculosis of the middle ear, is the recognition of the tubercle bacilli in the aural discharge. When the organisms are numerous, they can readily be recognized by any of the usual stains, but occasionally it is necessary to use what Milligan calls the best and most reliable means of establishing the diagnosis, properly conducted inoculation experiments. As the bacilli are found more frequently in the residual pus in the tympanum than in the canal, it is essential that the material used for examination be obtained from the deepest part of the chamber. A negative diagnosis cannot be made by the absence of organisms in a single examination. Frequently the material obtained from the ear must be repeatedly examined before the bacillus is found; especially is this necessary in the later stages, when there is profuse purulent discharge due to secondary infection from streptococci.

In the patient with pulmonary or other forms of tuberculosis, and with subsequent otorrhea, the diagnosis is greatly facilitated, and no serious difficulty need be apprehended in estimating the true nature of the case. A difficulty, however, arises in cases of purulent otorrhea with profuse discharge and extensive tissue disintegration, in which general tubeculosis develops at a latter stage. It is oft-times difficult to detect the bacilli, as the usual pus organisms present prevent the recognition of the tuberculous element. Under such conditions the characteristic local features are absent and pain may be present, as in a case reported by Collins, in which during the course of acute miliary tuberculosis the patient presented the ordinary symtoms of an acute otitis media. The diagnosis in these cases is made by the general condition of the patient, the presence of laryngeal or naso-pharyngeal tuberculosis and various local manifestations suggestive of this affection, such as the rapid development of facial

paralysis, the intolerance of the middle ear to local application, and, as suggested by Milligan, the enlargement of the periotic ganglia.

The differential diagnosis from syphilis can be determined by the history of the case, the presence or absence of syphilitic stigmata elsewhere, the absence of the tubercle bacilli in the aural discharge, and the rapid disintegration and ulceration, not only of the middle ear, but also of the external canal in the specific affection. When otorrhea develops during the course of both syphilis and tuberculosis, as in a case reported by Bonnier that of a tuberculous and syphilitic patient, it may be extremely difficult to ascertain the real nature of the aural lesion. Careful bacteriologic investigation will, however, clear up the diagnosis. Lupus involving the middle ear is rare, but as it occurs only in conjunction with the manifestations of the disease upon the auricle and face, it will require no further mention here. Tuberculous otorrhea must sometimes be distinguished from that occuring during the course of diabetes. I have seen one case of this nature in which the urine contained a large amount of sugar and there was also evidence of beginning pulmonary tuberculosis; the otorrhea, however, in this instance was not tuberculous in nature. When granulation tissue is abundant and extends into the auditory canal in tuberculous otorrhea, the question will occasionally have to be determined as to its relation to other new formations. Visual examination will be of little value, and it is necessary to remove some of the tissue for microscopic examination and the presence or absence of the tubercle bacilli must also be determined.

As the natural history of aural tuberculosis is such that extensive alterations may and usually do take place before attention is called to it, the usual prophylactic measures adapted to the prevention of the affection in other parts are rarely applicable. When a tuberculous individual, however, has had at any time acute or chronic suppurative otitis media, it is always advisable to exercise special prophylactic measures directed to the avoidance of aural infection and especially so when the nasopharynx or tonsils are involved. Even in laryngeal tuberculosis without aural disease great care should be taken to prevent infection through the Eustachian tube.

It is unnecessary here to more than mention the general prophylactic measures, such as change of climate, environment, nourishing food, etc. Of special prophylactic importance in this connection is attention to any abnormalities or morbid changes in the nose or throat, whether tuberculous or otherwise and prompt attention should be given to attacks of myringitis or acute otitis media. The nose and throat should be carefully cleansed with an alkaline antiseptic solution, and all procedures tending toward forcing infected mucus through the tubes, as by the Valsalvian method of self-inflation, must be expressly prohibited. By observing these rules much can be done to prevent infection of the middle ear on the part of the patient and, following out the same indications, it should be the duty of the physician to absolutely avoid under all circumstances the use of the Politzer air douche. I firmly believe that the middle ear is infected in this manner more often than is generally thought, by the endeavors of the physician to relieve an intercurrent simple salpingitis in a tuberculous individual.

As I have emphasized in a previous article, the treatment of aural tuberculosis is essentially that of the treatment of tuberculous disease elsewhere. The signal note of success, if success is to be had at all, is in the use of such general constitutional remedies as seen best suited to the individal conditions. The hypophosphites, strychnin, creosote and its congeners are indicative of the general remedies to be used. Nourishing food and change of climate and environment are just as necessary in aural tuberculosis as in the pulmonary form. Buck reports a case of early tuberculosis in which local treatment was not used at all, but the disease was arrested by sending the patient for a long stay in the Adirondack mountains. Tuberculin has been used by Lucae, Bezold and others, but, as in other forms of tuberculosis, no appreciable benefit seemed to be derived from its use, and in some cases there appeared to be considerable harm attending its administration.

Locally, the treatment may be considered under two headings, surgical and medical and the choice will depend upon the extent of the aural involvement the presence or absence of tuberculosis elsewhere and the general physical condition of the patient. Usu-

ally surgical measures are contraindicated except in those very few cases in which there is no ascertainable tuberculous focus elsewhere and in which the area of aural infection is limited. When the condition of the patient is such that an operation is justifiable, it is essential that every portion of the diseased tissue be removed and a free open wound be allowed to remain. Even if the patient is in fair condition physically, it is of great value to place him upon general constitutional remedies and a nourishing diet for several weeks before recourse is had to operative measures, much better results being obtained in this manner than when the diseased tissue is immediately removed without special constitutional preparation.

The local treatment may be summed up in the axiom, keep the parts clean and meet indications as they arise. The middle ear should be thoroughly cleansed with hydrogen peroxide, all pus and debris removed, and granulation tissue snared away or kept down by chromic acid. A nonirritating antiseptic powder may then be lightly dusted over the parts, or, what is still better and has given the best results in my hands, has been the local application of a thin film of iodoform and the use of iodoform-gauze packing extending well into the middle ear. Free drainage is favored by this method and, if the parts are kept thoroughly clean, quite favorable results are obtained. Buck douches the ear with tepid water and then applies a nonirritating antiseptic powder.

Following the successful results obtained from the use of lactic acid in laryngeal tuberculosis, it may be used here in the same strength and manner, preliminary cocainization, however, being necessary before any such applications are made. Any of the remedies used in nontuberculous otorrhea may prove of service, such as chlorid of zinc, balsam of Peru, creosote in alcohol and glycerin, and absolute alcohol and carbolic acid, but it should always be kept in mind that, whatever form of local treatment is adopted, general constitutional measures are absolutely imperative.

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XXXIV.

LEUCOPLAKIA.*

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Perrin, in opening the discussion, calls attention to the fact that leucoplakia is not limited to the mucous membrane of the mouth, but is found also upon that of the vulva and prepuce, the urinary tract, anus, pharynx, larynx, and middle ear. The name leucoplakia (leucoplasia) is applicable to all the white *dyskeratoses;* they are produced by a chronic inflammation of the derma, excited or maintained by repeated and prolonged irritation.

Relation of Leucoplakia to Syphilis According to Perrin, a distinction should be made between the leucoplakias of the internal aspect of the cheeks, the lips and those of the tongue. The first are found frequently but not always in syphilitics and are usually due solely to the use of tobacco. The lingual patches are essentially of syphilitic origin: Syphilis should be looked for in all cases. Perrin does not, however, deny the existence of non-syphilitic leucoplakias of the tongue.

Barthelemy does not make this distinction. In 83 cases 68 were known to have syphilis.

Gaucher and Sergent state categorically that buccolingual leucoplakia is always of syphilitic origin: 90 to 95 per cent show acquired syphilis; the remainder have "conceptional" or hereditary syphilis.

These conclusions are opposed by the statistical results of Fournier. In 324 cases of leucoplakia, he found syphilis 259 times. He believes that Gaucher and Sergent include in their list cases of sclerotic syphilitic lesions, which are not leucoplakia. This latter is a parasyphilitic

*Discussion in the Section for Dermatology and Syphilology of the Thirteenth International Medical Congress, Reported in the Gazette hebdom de med. and de chirurg, 1900, No. 74.

lesion, which should be separated from all the forms of tertiary glossitis.

Fournier and Du Castel regard the term leucoplakia as badly defined; the latter distinguishes two forms, one of a gray color which is a syphilitic affection, the other white, which is para-syphilitic.

Influence of Tobacco upon Bucco-lingual Leucoplakia.

The action of tobacco is marked, since in 100 cases, Fournier found 97 smokers. One might think *a priori* that leucoplakia is for this reason rare in women, nevertheless ZAMBACO found in Constantinople the same difference between the two sexes as in Paris. Leucoplakia remains however a benign affection in women. Tobacco of the East is less irritating than French tobacco, and leucoplakia is not very common in the Orient. It should be mentioned that tobacco is especially harmful in persons who have had syphilis, as shown by a case of Barthelemy of a man who had smoked thirty cigars a day for thirty years, and who showed no sign of leucoplakia; he subsequently acquired syphilis and two years later showed a leucoplakia.

Effect of Antisyphilitic Treatment.

According to Barthelemy, injections of mercury may lead to a complete cure. Such treatment generally, however, simply arrests the development of the affection and renders degeneration less frequent.

Relation to Epithelioma.

According to Perrin, the essential lesions of leucoplakia, are the keratinization of the superficial epithelium, the formation of a layer of cells provided with keratohyalin *(cutization* of the mucosa) and in the derma a cellular infiltration tending toward sclerosis. The process of keratinization is furthermore frequently irregular. Later, leucoplakia becomes complicated with papillomatous formations which may or may not develop into cancer. Cancer may on the other hand develop without a preceeding papilloma. Epithelioma in general begins at the level of the fissures and ulcerations, in the dekeratinized regions, sometimes in the center of the horny layer by formation of epidermal masses.

According to Gaucher and Sergent every leucoplakia represents an intermediate stage between syphilis and

epithelioma. In a case of leucoplakia with a smooth varnished surface, they found a structure identical with that of a horny papilloma with epidermal globules.

The frequency of epithelioma following leucoplakia is marked; according to Perrin in 25 per cent of the cases. Fournier gives 30 per cent; others 50 per cent. These figures are the minimum; according to A. Fournier, in many cases of epithelioma, the antecedent leucoplakia is overlooked.

The development of epithelioma is slow and more benign than in cases not following leucoplakia.

Treatment of Leucoplakia.

The prophylactic treatment consists naturally in the suppression of tobacco in the syphilitic cases.

Gaucher and Sergent recommend applications twice a day of bichromate of potash (treatment proposed first by WATRASZEWSKI) continued for months and years. Papillomatous excrescences are to be treated with the galvanocautery. Zambaco practises cauterization with the acid nitrate of mercury. Perrin removes surgically the affected tissue wherever possible.

ABSTRACTS FROM CURRENT OTOLOGIC, RHINOLOGIC AND LARYNGOLOGIC LITERATURE.

I.—EAR.

Lateral Sinus Thrombosis and Leptomeningitis Both Complicating Acute Suppurative Otitis Media: Complete Perforation of the Cranial Wall Above and External to the Antrum.

PHILLIPS, WENDELL C. M. D. (*Med. News*, April 21, 1900.) Case 1.—Male, fifty years, previously had slight suppuration in left ear, which had stopped three weeks before. Had pain localized over mastoid, but extending over left hemisphere and over lateral and longitudinal sinuses; chills and vomiting for two weeks; several rigors at time of examination; no mastoid swelling, and but little tenderness; pulse 110; temperature, 101.4; mucopurulent discharge from canal. Diagnosis of infective sinus disease, and immediate operation. No pus found in mastoid; bone very flinty. Lateral sinus opened one and a half inches; filled with clot. Incision extended from above and posteriorly to the angle through the sigmoid and well down toward the jugular bulb, and all granulation masses and clot removed. Sinus and wound packed with iodoform gauze. Shock was considerable, but recovery was complete, owing doubtless to the early diagnosis.

Case 2.—Female, admitted to the hospital with temperature of 103 F., as a case of acute mastoiditis and an ice coil applied. The pain subsided, and patient was up and about, complaining but little. On the sixth day after entrance at 4:30 a. m., she became delirious, pupillary reaction sluggish, limbs rigid and semiflexed, respiration shallow, and soon complete unconsciousness. Pulse at first very rapid, then became slow. Preparations were made for an operation, but condition became so much worse that it was abandoned, and death occurred at 10:30 a. m. the same day.

At the autopsy the tympanum and mastoid were found full of pus; the sinuses were healthy; there was subarachnoid infiltration of pus indicative of a general lep-

tomeningitis. The entire mastoid, except at the top, was one large abscess cavity. The internal wall was entirely gone, and the dura had been perforated posterior to the tegmen tympani; brain not involved.

In reviewing the case, the author says the ice bag ought not to have been used, since it masked the symptoms, whereas an early operation would probably have saved life. That so extensive a leptomeningitis could occur with so few meningeal symptoms either of eye or of the mental faculties is remarkable. The sudden shock followed by death was probably due to the rapid escape of pus through the perforation.

"In all cases of mastoid inflammation in which there is no external swelling or even marked indications of disease the ice coil should be resorted to with caution."

Richards.

The Value of Electrolytic Dilation of the Eustachian Tubes in Chronic Tubal Catarrh and Chronic Catarrhal Otitis Media.

DUEL, ARTHUR B. M. D. (*Am. Jour. Med. Sciences*, April, 1900.) Many cases of chronic acute catarrh begin with an inflammatory hyperplasia in the narrow Eustachian tubes, producing a mechanical and functional stagnation and a lowering of air pressure in the tympanum. This being the case, it becomes evident that the most important point in this treatment is to ventilate the tympanum by the early establishment and constant maintainance of the patency of the Eustachian tube. In an early stage of tubal obstruction the Eustachian catheter and stimulating vapors answer, but later, when the exudate has begun to organize into fibrous tissue, it has been found necessary to use bougies to overcome the obstruction; these have been of whalebone, metal and cotton, and used in many cases with marked success.

To bring about the absorption, of the exudate the author has devised a method by electrolysis, which, although not original in idea, having been previously used by W. E. Stevenson and Robert Newman, is original so far as the practical working out of the details is concerned.

The bougies are made of gold, and correspond in size to Nos. 2, 3, and 4 of the French scale. The smaller sizes

are usually used. It probably does not matter so much about the size as that the current should be kept in contact with the hyperplastic tissue long enough for the electrolytic action to take place. The bougie is drawn through a small pure silver catheter until the oval head fits snugly in the opening at the tip. The other end is connected one and one-half inch from the opening by a delicate handle with the negative pole of the battery.

The catheter, after being carefully bent so that it will fit accurately in the mouth of the Eustachian tube, is insulated by winding a narrow strip of rubber tissue spirally from tip to ring.

This being renewed each time it is used, the catheter and bougie being boiled, cleanliness is insured.

The nose is cleaned, and anesthetized with a ten per cent solution of cocain.

The patient is connected with the positive pole of the battery by an ordinary contact electrode held in the hand. The negative pole is attached to the bougie as just described. The tube is bougied in the usual manner, the bougie being pushed along until it meets with a definite obstruction. Instead of forcing through this by heavy pressure the current is turned on up to form one to three m. amp., according to the sensation of the patient, and after twenty seconds to a minute the bougie usually will be felt to pass on through the softened stricture with a gentle pressure. At the same time the patient will usually hear "bubbles breaking in the ear." If the desired result is not obtained at the end of a minute or two, no greater pressure should be used, but more current strength turned on.

The author does not use over five milliamperes current strength, nor a contact of longer than five minutes at a sitting. This is repeated at intervals of one week to one month, being guided as to its frequency by the result as indicated by inflation every other day. Two to four sittings are usually sufficient. The battery should have from thirty to fifty volts, and should be supplied with a good rheostat and miliammeter. Some fifty cases are recorded, and the author regards this method of removing an organized exudate preferable to any other, one application is frequently sufficient, since it is more rapid,

more efficient, the results more permanent. All narrow tubes should be restored to their normal calibre, and where the narrowing is due to an organized inflammatory exudate, the best means of accomplishing this is by electrolysis. *Richards.*

Eustachian Catheterization.

RICHEY, S. O. M. D., (*Jour. A. M. A.*, May 19, 1900.) The catheter should be used in all cases in preference to the Politzer bag or the Vasalvan method, as damage can be done with them.

Properly inserted, the catheter is free from danger, and may be used for the introduction of solutions into the tympanic cavity, or for the withdrawal of secretion from the Eustachian tube by suction. *Richards.*

Chronic Otitis Media Resulting from Contamination in the Treatment of Acute Otitis Media.

TODD, FRANK C. (*International Clinics.*) Vol II, Tenth Series. The writer contends that the piston syringe commonly used by aurists in the routine treatment of suppurations of the mindle ear is a dangerous instrument.

Investigations showed that germs are prevalent in quantity and in numerous varieties upon the point and washer of the syringe cultures taken from syringes belonging to five different aurists demonstrated the presence of the staphylococcus pyogenes albus, the streptococcus pyogenes, the diplococcus of pneumonia and the bacillus tuberculosis. One of the syringes was sterilized and then used daily in routine treatment for two weeks. Cultures were then taken from the point and washer at intervals of two weeks while the following solutions were being used: sterile water, saturated solution of boric acid, bichlorid of mercury (1 in 5000), carbolic acid (two and a half and five per cent.)

Cultures obtained from the point and washer in every instance, though several attempts were sometimes necessary before a growth was obtained while the syringe was still in use. The solutions of carbolic acid and bichlorid of mercury will in time destroy the bacteria, but are of little value in preventing the conveyence of sepsis while the syringe is in daily use, as sufficient time does not elapse for the destruction of the bacteria. The author describes a syringe constructed so that the point which

comes in contact with the ear admits of sterilization and can be easily removed. Through this point there is no suction, which prevents the entrance of infectious material. *Seymour Oppenheimer.*

Faradization in Tinnitus Aurium.

PRICE W. (*Journal of Electro-Therapeutics*, September, 1900. The author recommends the use of the faradic current in tinnitus aurium employed in the following manner. The negative cord from a good coil is attached to a large copper electrode; from the positive terminal, two cords are brought, each attached to an ordinary hand electrode. Both feet are placed against the negative electrode. Each hand grasps one of the positive electrodes. The coil is now set working, until the strength of the current is as much as can be endured with comfort. The knuckles of one hand are now applied to the effected ear. The amount of current passing through the ear can be regulated to a nicety as follows: Slightly open the hand against the ear and the current is at once proportionately decreased. Shut that hand while opening the other and the current through the ear is at once increased. This treatment has in the author's practice proven of benefit. *Seymour Oppenheimer.*

Report of a case of Spontaneous Cure of an Acute Mastoiditis.

MCGOVERN H. S. (*The Laryngoscope*, October, 1900.) The report of a case of acute mastoiditis which had opened through the cortex of the mastoid cells, followed by the exfoliation of a mass of necrotic tissue and spontaneous healing. *Seymour Oppenheimer.*

Treatment of Catarrhal Adhesive Processes in the Middle Ear by Means of Intratubal Pilocarpin Injections.

FISCHENICH, F., Wiesbaden. (*Berlin Klinisch Wochenschft*, November 12, 1900.) The author recommends in these cases the injection into the tynpanic cavity of a two per cent solution of pilocarpin. This is done by means of a flexible tubal canula passing through the catheter.

When aucultation shows the tube and catheter to be in position, 6-8 drops of the pilocarpin solution are put into the tube and forced into the tympanic cavity with a balloon. The dose is to be increased up to 10-12-16 drops. Aside from some slight pain and dizziness no

untoward symptoms were observed. 30 to 35 injections were often necessary but how often they are to be made the author does not state. With this treatment a considderable restoration of hearing and relief to tinnitus has been obtained. Catarrhal swelling of the Eustachian tube is also greatly relieved. The observations were based upon 120 cases. *S. E. Allen.*

What is the Position to be Taken at this Time Concerning the Treatment of Chronic Purulent Otitis Media; and How do we Stand on the Cholesteatoma Question.

LEUERT, DR. E., Konigsberg. *(Muenchener Klin. Wochenshrift, Nos. 39, 40, 41,* September and October, 1900.) The above is a very complete and intelligent discussion of these subjects, extending through three numbers of the Wochenschrift. The author claims that the position of the perforation in chronic cases allows us to draw fairly accurate conclusions as to the situation of the trouble. Thirteen small schematic drawings of perforations differently situated serve to illustrate the contention. As to operative interference definite conclusions may be obtained from inspection. Perforations indicating disease of ossicles call for their removal; those indicating attic or antrum disease, for the radical operation; while perforations confined to the lower quadrants indicate disease limited to the tympanic cavity proper and do not justify operative interference. The fact that conservative treatment fails in some of these cases is no justification for operating. The best treatment for these cases is irrigation through the catheter. The subject of cholesteatoma is gone into very thoroughly. After a very careful consideration of the varieties and their etiology, the author adopts the generally accepted theory of Haberman. Cholesteatoma formation is favored when the inflamation is of a certain moderate grade. If it exceeds this, the chances of cholesteatoma formation are reduced; and if the inflammation becomes very slight the proliferation of epidermis is very slow and the enlargement of the mass takes place as gradually and slowly as is noticed in the cholesteatoma of pia mater. Marginal perforations in upper quadrants are most favorable for the formation of these epithelial growths or accumulations.

A reading of the original article is recommended, for

while not much new is to be found, the author has given us a very interesting and readable review of the subject and has certainly put the indications for operation on a more scientific basis. *S. E. Allen.*

A Case of Bezold's Mastoiditis Secondary to Facial Erysipelas; Operation; Recurrence of the Erysipelas within Twenty-four Hours; Cure.

DUNN, RICHMOND. (*Archives of Otology*, Vol. XXIX, Nos. 2 and 3.) The patient after ten days suffering from general facial erysipelas, experienced severe pain in the left side of the head and three or four days later the left ear began to discharge. The severe head pains continued till seen by the author three weeks later. On examination: pulse 90, temperature 99.5°F. The left mastoid process and for two inches below it was swollen, edematous and extremely sensitive to pressure.

Operation revealed practically total destruction of the mastoid; the loss of the inner plate laying bare a large area of dura mater.

As there were no symptoms of sinus thrombosis, the sinus was not explored.

Erysipelas re-appeared next morning and temperature reached 102°F. The reddened area was painted three times with carbolic acid and covered with gauze soaked in alcohol. The following morning temperature was down to 99°F. and convalescence from that time onwards was uneventful. *Campbell.*

Re-Examination of the Hearing of Deaf-Mutes Originally Tested in 1893.

BEZOLD, MUNICH. (*Archives of Otology*, Vol. XXIX, Nos. 2 and 3.) The result of re-examination with Edelman's new instruments showed the number of totally deaf is less than before. Two deaf-mutes, however, lost considerable hearing in the interval, and it would seem as if we were justified in assuming that some cases always show slow advance of the destructive processes in the cochlea.

The other twenty deaf-mutes showed about the same hearing at both tests, or a moderate increase averaging six semitones.

Four cases characterized by excessively defective comprehension for speech despite extensive perception for the

tone scale, prove accessibility to instruction by speech through the ear. We know that wherever a satisfactory remnant of hearing exists, it can be utilized for the comprehension of the voice by well-conducted instruction, no matter whether the pathologic alterations producing the defects of hearing lie in the cochlea or at any locality beyond. *Campbell.*

Three Cases of Diabetic Mastoiditis.

KIEL, FRIEDRICH. (*Archives of Otology*, Vol. XXIX, Nos. 2 and 3.) Case I. A man aged 50, for years has suffered from diabetes; the amount of sugar never exceeding 1 to 2 per cent and easily suppressed by dieting. He was seized with left-sided ear and head pain. The mastoid apex was tender on pressure, the external auditory canal swollen, the mt. dark-red, bullous and bulging in its upper posterior half. Upon paracentesis a thin sanguinolent fluid escaped. After a second paracentesis profuse suppuration persisted and about one month after the inception of ear symptomes he complained of constant dull headache and sleepless nights. The upper wall of the external auditory meatus was sinking, without external changes of the mastoid and without sensibility upon pressure.

Upon operation under chloroform the mastoid was found of dirty gray color, brittle and partially sequestrated. The antrum was large and filled with pus. The tissues were removed as far back as the sinus and downward to the mastoid tip. On the day following the operation the amount of sugar increased to 1.85 per cent but disappeared after two days. Hearing faculty for conversation was preserved.

Case II. A woman, aged 46, for two weeks had suffered for two weeks from acute suppuration of the left ear and for a few days from intense pain over the mastoid.

The external meatus is filled with pus, the posterior wall bulges, the mastoid process sensative to pressure and its soft parts slightly infiltrated.

Urine contains 5.85 per cent of sugar.

On the following day the swelling over the mastoid and of the upper and posterior wall of the external meatus had so much increased that operation was undertaken. Anesthesia was begun with chloroform and continued

with ether. On removing the cortex slightly fetid pus came from a large bone cavity communicating with the spacious antrum. The radical operation was done. Next day urine contained 2.42 per cent of sugar. There was vomiting, anorexia, thirst. Evening temperature 37.2°C. The next night breathing became deep and labored with the picture of begining diabetic coma. Somnolence increased more and more and death supervened.

Case III. A man, aged 42, a hard drinker who for two years had left middle ear suppuration. Sudden pain and swelling behind the ear brought him to the hospital.

Urine contained albumin and 5 per cent sugar. He had arterio-sclerosis with small irregular and unequal pulse.

There was deep-seated fluctuation which extended from the temporal line down along the posterior edge of the sterno-cleido-mastoid muscle. The abscess was opened under local anesthesia and the probe detected bare bone at the mastoid apex. The quantity of sugar was reduced to $^1/_2$-$1^1/_4$ per cent, the urine still contained albumin and profuse diarrhea appeared.

In diabetic mastoiditis the subjective and objective symptoms are out of proportion to the extreme extent of the disease.

The danger from operating consists in the subsequent appearance of sepsis and coma.

Coma is not due to operation or to shock but to the narcosis.

Naunyn's suggestion of the administration of sodium bicarbonate as a prophylactic in operations on diabetics, in addition to a regulated diet before and after the narcosis in order to avoid the intoxication with acids and the danger of the appearance of coma, is to be commended.

Campbell.

Sharply Circumscribed Sound Defects in the Hearing-Fields of Certain Deaf-Mutes.

SCHWENDT, Basel. (*Archives of Otology*. Vol. XXIX, Nos. 2 and 3.) CASE I. A boy, aged 7, who, through an attack of meningitis at the age of seven months, became blind in the right eye and absolutely deaf in his left ear. The right ear can well distinguish all vowels. The lower limit of his hearing lies at small c, the upper at h^6. The most peculiar feature in his case is a sharply defined deaf-

ness for the note f^5, whereas c^5 and g^5 are clearly heard.

CASE II. A boy, aged 9, became deaf in his third year in consequence of influenza. The lower limit of his hearing lies in both ears at center C, the upper limit right at f^1, in the left at a^1. He cannot distinguish vowels, but he can hear them if they are shouted. The only consonant which he can recognize is R.

His duration of perception of the note c is greatly decreased.

CASE III. A girl, aged 21, completely deaf in her right ear in consequence of an attack of meningitis. In the left the upper limit lies immediately above g^2. The lower limit D_2. She can hear all consonants with the exception of S. Moderately loud conversation she can hear but when speech is too loud she is annoyed by it and cannot understand it at all well. *Campbell.*

Two Cases of Otitic Lateral-Sinus Disease; Operations, with Ligation of the Jugular.

JOACHIM, New Orleans. (*Archives of Otology*, Vol. XXIX, No. 4.) CASE I. A man, aged 24, with bilateral intermittent otorrhea since childhood. Pain suddenly developed in the head near the right ear and he had a chill. followed by a rise of temperature, anorexia and malaise. When admitted to the hospital, temperature 102°F, pulse 135, sordes on teeth. The right pupil is dilated and slowly responds to light. Rigidity of the neck. The mastoid region is tender, red and swollen. A fetid discharge comes from the right ear and swelling and tenderness is present along the course of the internal jugular vein. Mt. is perforated in the upper and posterior segment.

On opening the sclerotic mastoid the antrum was found filled with fetid granulations. Opening the bone backward a large perisinal pus accumulation was freed and the lateral sinus laid bare. Inserting a trochar into the lateral sinus showed fluid fetid pus. The internal jugular vein was now ligated below the omo-hyoid muscle its contents found purulent and from this point upward for about 3 inches the vein was removed. The distal end of the lateral sinus was closed by a cord-like mass of fibrin. The patient reacted well from the shock of the operation but pyemic symptoms persisted and death took place twelve days after the operation. On post-mortem exam-

ination small metastatic abscesses in great number were found in the right lung. Brain substance congested; right lateral sinus thrombosed; a few drops of pus between dura and bone under the sigmoid sinus; a large quantity of pus at the jugular foramen and from there, accumulations in smooth-walled pockets extended to behind the esophagus, under the deep muscles of the neck, along the sheath and within the jugular vein, and into the vertebral canal.

CASE II. A man, aged 18, who, about 17 months earlier, first complained of pain in the right ear after diving. This was followed by a bloody discharge but recovery took place in a few weeks. In the following year he had a similar attack. Ten days prior to his admission to the hospital he was accidentally hit by an iron pipe on the right side of the back of the head. Half an hour after the injury pain began which gradually increased in severity. Fever, chills, profuse perspiration, diplopia followed one another in quick succession. The head became bent to the right side. On admission, temperatnre 102°F, pulse 120 and weak. The space along the course of the internal jugular, swollen, tender and resistant to touch.

Mt. in its upper portion appeared like a flat smooth granuloma, the anterior half bulged and was red. The mastoid region swollen and tender on pressure.

The radical operation was done; adjacent the lateral sinus was found a fetid, pulsating blackish-looking mass. The lateral sigmoid sinus were opened and a solid coagulum removed. The internal jugular vein was fetid and its upper part and together with the superimposed glands removed. Complete right facial and bilateral abducens paralysis were noted after the operation. On removing the dressings on the fifth day after the operation, the upper wound had a fetid odor with a limited area of blue pus on its surface. The lower wound was reopened and thoroughly cleansed. After this the recovery was uneventful, but facial paralysis persisted and he was left with just sufficient vision to move about unaided. *Campbell.*

Contribution to the Knowledge of the Otogenous Diseases of the Brain, Meninges and Sinuses.

LEHR, WITTE AND MUCK, assistants to Körner's clinic, Rostock. (*Archives of Otologo*, Vol. XXIX, Nos. 2, 3 and

4.) The series of cases reported, thirty two in number, cannot be satisfactorily abstracted and should be read in the original reports. *Campbell.*

Cholesteatoma of the Middle Ear, and Its Radical Operation; with the Report of a Case.

ZIMMERMANN, Milwaukee. (*Archives of Otology*, Vol. XXIX, No. 4.) The author, after describing the causation and development of cholesteatoma, gives a very clear account of the correct treatment as outlined by Stacke. The author then reports the case of a man aged 26 who presented the following condition.

Left ear: Has large masses of granulations projecting from the external meatus. Fetid discharge and extensive necrosis of the tympanum.

Right ear: A large granulation springs from the posterior wall of the tympanic cavity. Attic was filled with fetid cholesteatomatous matter.

On both sides curetment and suitable after treatment was employed. Several months later the patient returned with the history that about one month prior to his reappearance an abscess had formed on the right side of his neck. A fistulous scar, one inch in length, commences 1/2 inch below the tip of mastoid and runs down along the course of the sterno-cleido-mastoid muscle (Bezold's mastoiditis). Total facial paralysis fetid discharge from right ear; posterior meatal wall bulges forward. Some cholesteatomatous masses were evacuated with a probe. The radical operation was undertaken and all cavities of the middle ear and posterior cranial fossa were widely opened and thoroughly scraped. A perforation of the medial aspect of the tip of the mastoid process lead into a fistula which ran downward to the fistula on the neck. The tip was chiseled away and fistula scraped. The dura was largely exposed and found thickened. No granulations ever developed on it.

The patient recovered well and hearing is better than before operation. The facial paralysis was cured and with six months after treatment epidermization was complete.

Campbell.

A New Case of Mastoiditis in a Diabetic Patient.

MUCK, Rostock. (*Archives of Otology*, Vol. XXIX, No. 4.) An official, aged 47, has suffered from diabetes for

two years. He had a ravenous, unrestricted appetite and to quench thirst drank great quantities of beer. Having contracted "a cold," gastric catarrh, diarrhea and icterus were quickly followed by epistaxis and intense pain in the right ear. On examination the mt. was reddened and greatly bulging, the glands along the sterno-cleido-mastoid muscle enlarged and the mastoid era slightly tender. Paracentesis was done and the auditory canal packed with gauze. Urine contained 2 per cent. sugar. For two weeks there was a gradual improvement in his condition then inflammation with pain set in anew. Neuralgic pains radiate from ear toward the top of the head. Sagging of the posterior meatal wall, yellowish-brown pus in meatus with a pulsating reflex.

On operation the bone was found yellowish-red, the cortex sclerosed. Pus and blood welled up through a fistula which led to the antrum filled with purple granulations.

Eight weeks after operation the wound was perfectly healed. The mt. was thickened and lustreless but whispered words could be heard at a distance of 6 M.

Campbell.

Upon the Color of Living Rachitic Bone as Found during Mastoid Operations in Rachitic Children.

MUCK, ROSTOCK. (*Archives of Otology*, Vol. XXIX, No. 4.) The macroscopic condition of a rachitic mastoid during life, differs from that on the post-mortem table whereby decreased blood supply and other post-mortem changes it has lost the bright rose color which it has during life.

This color is solely brought about by increase of the vascular and medullary formations. A remarkable feature is that this bone does not bleed as one is accustomed to see it in infectious inflammations of bone. The author then verifies these statements by describing the conditions found in two infants on whom he performed mastoid operations. *Campbell.*

A Personal Experience of an Acute Attack of Autophony.

KNAPP, New York. (*Archives of Otology*, Vol. XXIX, No. 4.) The doctor being reduced in flesh by an acute attack of summer diarrhea noted that the symptom of autophony was preceded by hyperemia, swelling and

stiffness of the walls of the pharynx. At first the autophony was only in one ear, then in both; at first in short attacks controllable by negative valsalva or stooping, later lasting a few hours together, not relieved by negative valsalva and by stooping, only so long as the head was thrown down. While lying down it always disappeared. At no time was there any otitis connected with it, The mechanical cause was a patency of the Eustachian tubes, their easy closure being impeded by the rigidity of their walls, especially the membranous and during the inspiratory act air rushing directly through the eustachian tubes into the tympanic cavities. The whole complaint was recovered from as his general health improved. *Campbell.*

The Significance of Earache in Children.

HALSTEAD, T. H., M. D., Syracuse, New York. After reviewing the subject the author's conclusions are given as follows: Earache is usually due to acute inflammation of the middle ear, suppurative or catarrhal. Purulent otitis media is nearly always present in the acute infectious diseases of the gastro-intestinal and respiratory tracts in young children, and many cases of death from these affections result from unrecognized and untreated abscesses of the middle ear. Repeated earaches in children are usually a sign of an acute attack of chronic otitis, the cause being adenoid growths, and in adult life, many a case of so-called catarrhal or progressive deafness is often only the final stage of an otitis media which began in childhood, at which time it was due to adenoids, and was practically curable. *Richards.*

Chronic Ear Vertigo (Meniere's Disease); Its Mechanism and Surgical Treatment.

BURNETT, CHARLES H., M. D., Philadelphia. (*Philadelphia Medical Journal*, Sept. 22, 1900.) A review of the anatomy and physiology of the internal ear is first given. This disease occurs in the great majority of cases in chronic sclerotic otitis media, and as a rule only one is the cause of ear-vertigo, and this one is always profoundly deaf, and may be the seat of distressing tinnitus. The patient is seized with a sudden unaccountable vertigo, with increased tinnitus in the affected ear. The attack lasts from a few minutes to half an hour; nausea may be pres-

ent in the early attacks, but is not as a rule until later in the disease. As the seizure becomes more frequent, more severe and longer in duration, nausea and vomiting may be very intense, and result in a kind of collaps, with pallid face and clammy surface, but *without loss of consciousness*. "The fact that the patient does not lose conciousness from ear-vertigo serves as the great differential guide in diagnosis between ear-vertigo and apoplexy and epilepsy, with both of which it is often confounded at first. The apparent motion in ear-vertigo is generally toward the affected ear, in which direction the patient tends to fall. When both ears are the cause of ear-vertigo, the patient is entirely unable to walk, and sits down whenever he is attacked, even in the street. In such cases the patient's actions are often mistakenly attributed to alcoholic intoxication. These phenomena have been termed Ménière's symptoms, or disease."

The first attacks are usually misinterpreted, and it is not until later that an examination reveals the fact that the patient is a victim of chronic ear-vertigo, upon which the tympanic membrane will be found opaque, thickened and retracted, the malleus drawn upward and backward toward the aditus and the incudo-stapedial joint is usually visible through the upper posterior quadrant.

The author regards the retraction of the membrane and and ossicles as the mechanical cause of the ear-vertigo. "The retracted chain of bonelets, by pressing the stapes inward into the oval window and holding it there in a condition of undue retraction upon the vestibule and its fluid, compromises the latter space and compresses the labyrinthine fluid upon the ampullar nerves in the semicircular canals, and ear-vertigo is evoked." Normally, this pressure is compensated by the yielding toward the drum cavity of the membrane of the round window.

The cause being mechanical in the author's view, he has devised an operation for its correction, consisting of the surgical removal of the incus for the cases of ear-vertigo originating in chronic catarrhal otitis. "The removal of the incus breaks the retractive force of the tensor tympani and malleus exerted through the incus upon the stapes, and the latter bonelet is liberated." Under ether, he makes an incision close behind the short process of the

malleus, following the periphery of the drum backward and downward until below a line drawn horizontally through the umbo. (The flap thus made is pushed inward toward the promontory by means of a probe armed with a small dossil of sterilized cotton.) The incus being now visible, is gently disarticulated from the stapes by drawing the former outward and downward by the use of an incus-hook knife passed behind its long limb, which is next grasped by special forceps and drawn cautiously downward and outward into the auditory canal and removed from the ear. The operation is now finished. The meatus is stopped with sterilized cotton, and the ear let alone from 24 to 48 hours. As a rule no reaction follows.

In those cases of ear-vertigo dependent upon chronic purulent processes, the incus is detached and removed first, and the remnant of the diseased membrane and malleus then completely excised; "hemorrhage in these cases is always relatively great." After the operation the ear requires syringing with a 1 to 5000 bichlorid solution and should not be stopped with cotton, but allowed to discharge. Subsequent treatment is that of chronic otitis media. The author has performed this operation in its two forms in 27 cases of ear-vertigo, and in no instance has it failed to give relief. *Richards.*

Practical Points in the Diagnosis and Treatment of of Otitic Pyemia.

GRANT, DUNDAS, F.R.C.S. (*Journal of Laryngology, Rhinology and Otology*, October, 1900.) The diagnosis of otitic pyemia depends on the presence of the signs of pyemia in general, associated with acute or chronic suppurative disease in the middle ear or the bone surrounding it. When, therefore, in the course of acute or chronic suppurative inflammation of the middle ear, the patient is attacked with rigors and the temperature undergoes oscillation between elevation and depression, we may safely assume that we have to deal with otitic pyemia in one of its forms, more especially if metastases in the joints, lungs, subcutaneous tissue, or muscles or other organs and enlargement of the spleen supervene. Less frequently a continuous high temperature, persisting in spite of free exit for discharge, and accompanied by rapid and intense lowering of the vital power, indicates to us that

a more purely septicemic process is in action. The casual nature of the association with the ear disease, in presence of the severe constitutional disturbance, may be overlooked by the physician, especially if he is not accustomed to examine the ear.

The pyrexia and constitutional disturbance may be attributed to other diseases, of which the chief are *typhoid fever*, *malaria*, *acute rheumatism*, *ulcerative endocarditis*, *acute tuberculosis*, and *meningitis*. The following are the chief points in the diagnosis of otitic pyemia from the diseases mentioned:

Typhoid fever sometimes commences with rigors, but as a rule this is not the case. The temperature rises by means of higher, somewhat remitting steps for three or four days, never reaching 104° on the first day, and never descending to normal on any evening during the first week. As a rule, also, its onset is not sudden, although occasionally it is so. If the blood is examined, it may be found to answer to Widal's reaction. The roseola may settle the diagnosis at the end of a week. Optic neuritis or choked disc suggests otitic pyemia rather than typhoid fever.

In *malaria* the rigors are more regular in their periodicity, and the results of quinin are generally diagnostic, while if circumstances favor the examination of the blood, the characteristic plasmodium may be discovered. In *pyemia*, on the other hand, the examination of the blood, though usually negative, sometimes reveals the presence of streptococci in cultures.

Acute rheumatism is seldom accompanied by rigors, the temperature is more steadily high, and the number of joints affected in succession is larger.

Acute ulcerative endocarditis, which might be termed *endocarditic pyemia*, resembles the otitic in its many aspects. The metastases affect chiefly the lungs, kidneys, spleen, liver, skin, and brain, the emboli in the latter organ affecting chiefly the left hemisphere, and so producing right-sided paralyses, which rapidly pass away. The absence of ear disease is, of course, an important factor in the diagnosis.

Acute tuberculosis is sometimes characterized by the occurrence of rigors, but there is generally evidence of

pulmonary involvement, and tubercle bacilli may be detected in the sputum. The attack has usually been preceded by gradual loss of health and wasting of tissue.

When the acute or chronic suppurative inflammation of the middle ear is recognized, the question may arise as to whether the sudden febrile disturbance is due to the aural disease or to some other morbid state coincidentally associated with it. There is no reason why the sufferer from chronic otitis should not be affected with some other disease, such as typhoid fever, pulmonary tuberculosis, or acute alcoholism. The possibility of these occurrences should not, however, influence our minds too much, or deter us, when in doubt, from making the exploration on which ultimate diagnosis and the safety of the patient's life may entirely depend.

Assuming that the disturbance of general health is attributable to the acute or chronic disease of the ear, we have to consider the diagnosis of otitic pyemia from the other possible dangerous sequelæ, and its recognition when combined with one or more of them. Of these the chief are *extradural abscess, purulent meningitis. cerebral* and *cerebellar abscess.*

Extradural abscess has usually a small orifice of outlet into the cavities of the middle ear, through either the roof or posterior wall, or through the lateral wall of the skull, or in both directions. When the escape is not free the patient suffers from headache, a tendency to coma, with febrile disturbance, all of which symptoms may undergo a remarkable diminution simultaneous with a flow of pus from the ear in much larger quantity than could possibly take place from the cavities in the interior of the temporal bone. When there is a perforation through the lateral wall of the skull, there is an accumulation of pus beneath the pericranium and a bulging of the scalp either above or somewhat behind the mastoid process. Pressure upon this may cause a copious flow of pus from the depths of the middle ear.

Meningitis is usually characterized by the early onset of delirium, violent headache, continuousness of high temperature, a rapidity of pulse, vomiting and obstinate constipation, with a tendency to strabismus and retraction of the head. In pyemia, on the other hand, the temperature

is, as a rule, oscillatory, although in the pure septicemic form it may be continuous. There is frequently also diarrhea. The symptoms described may arise either from serous or from purulent meningitis, and our chief means of diagnosis is lumbar puncture of the theca of the spinal cord.

In *abscess of the cerebrum or cerebellum* there is at the outset a rise of temperature, and possibly a rigor; but this subsides and the abscess remains latent till, after an interval, there supervene headache, slowness of cerebral action, with lowering of the rate of pulse and respiration, as well as of the temperature. There is often vomiting, the bowels are obstinate and confined, and there is great emaciation. In *tempero-sphenoidal abscess* there may be diverging strabismus from pressure on the third nerve, and weakness of the arm and leg on the opposite side of the body. In *cerebellar abscess* the weakness is in the limbs of the affected side. In complicated cases, therefore, the diagnosis of otitic pyemia from either of these conditions is fairly obvious.

When otitic pyemia, with or without thrombosis of the sinus, is present *in combination with cerebral abscess*, the temperature is that of the pyemia, but the pulse may be disproportionately slow. When otitic pyemia is *combined with meningitis*, the mental disturbance is much greater than when the pyemia exists alone, and the lumbar puncture will reveal the presence or absence of purulent meningitis. The data arrived at from the use of the ophthalmoscope are somewhat inconclusive as regards the presence of cerebral or cerebellar abscess. A dilatation of the retinal veins, with swelling of the disc, is strongly suggestive of thrombosed sinus, and when it is unilateral it indicates that the disease has extended to the cavernous sinus.

As have been said before, the crowning signs of otitic pyemia are the occurrence of metastatic suppuration in other parts of the body, though these may be so minute as as to give no physical signs.

Our diagnosis of otitic pyemia as such being thus established with considerable probability, we have to approach the diagnosis between the *thrombotic* and *non-thrombotic* forms.

When the condition arises as a result of the chronic suppuration of the middle ear of more than one year's standing, and especially if there is evidence of metastases in the lungs or pleura, it is practically certain that there is a thrombo-phlebitis of one or other of the sinuses. We are, however, helped by the search for local evidences of involvement of the venous channels first without, but afterward with, operative exploration. An abnormal degree of filling the external jugular vein would suggest that the internal jugular of the same side is obstructed; fullness above the orbit, with edema and distention of the contents of this cavity and dilatation of the retinal veins, would indicate plugging of the cavernous sinus. Tenderness, or the presence of an elongated swelling along the internal jugular vein, would indicate inflammation of this channel, or, at least, an inflammatory condition of the superjacent lymphatic glands. Occasionally the inflamed and suppurating vein may form a fluctuating swelling. Tenderness behind the mastoid region would suggest infiltration of the condylar or vertebral veins.

When, on the other hand, it is due to an acute suppuration, and the metastases affect rather the joints or the greater circulation, there is a probability that it has not been preceded by thrombo-phlebitis of the great sinuses, and it is of the non-thrombotic form.

The diagnosis of *sapremia* may still have to be made, because pus retained under pressure may give rise to the febrile and constitutional disturbance already described, with the exception of a metastatic abscess formation. It is, therefore, only after the free opening of the middle ear and the cavities connected with it that we may be able to judge as to whether the symptoms are due to this condition or to the infection of blood itself. In children the evacuation of a small quantity of pus from the middle ear, effected by paracentesis of the membrane, may suffice to remove all the febrile disturbance, and in the adult the same result sometimes follows the performance of the mastoid operation—the radical in chronic, the antral in acute cases—and we have then had to deal with sapremia or aseptic intoxication from retention of pus. Should not this evacuation lead to the disappearance of the febrile symptoms, we have to deal with pyemia; and

though in the acute cases we may postpone further exploration, treating the metastases as they arise, we must in the chronic expose and explore the lateral sinus. In any case, unless the mastoid operation evacuates the pus under pressure in some considerable quantity, we are not justified in abstaining from further operative exploration if the patient's symptoms are threatening. This is especially true when we are called upon to deal with a patient at a distance, though when the patient is in hospital under our continued supervision the rule admits sometimes of relaxation.

The confirmation of the diagnosis of thrombo-phlebitis cannot be carried further without *exploratory operations*, which frequently constitute the first step in the treatment of the disease.

The details of exposure of the lateral sinus vary in the hands of different operators, and must be ordered according to the nature of the case. When, during the performance of the mastoid operation, there is already an opening into the groove for the lateral sinus, this opening may be extended by means of the chisel and mallet, and the cutting or gouge forceps; but in the absence of such indications, and more especially when it is desired at the same time to explore the middle fossa of the skull, a trephine $^3/_4$ inch in diameter may be placed with its centre pin 1 inch behind the centre of the osseous meatus and $^1/_2$ inch above its centre; the opening may be extended upward and downward by means of bone forceps. If one forefinger is placed on the sinus and another on the jugular vein, and no fluctuation can be conveyed from one to the other, there is absolute thrombosis somewhere between the two fingers. The condition of the contents of the sinus may then be decided by means of puncture, the part being first carefully sterilized with prechlorid or biniodid of mercury, and a hypodermic syringe, also carefully sterilized, being employed. The withdrawal of pure blood offers no positive assurance of any kind, as it does not exclude the possibility of there being a parietal thrombosis; the withdrawal of pus would indicate without doubt the blood in the sinus had coagulated, and that the thrombus was undergoing purulent disintegration; the absence of any fluid t all would indicate that the needle had entered a throm-

bus which, at the perforated part, at least, had not yet broken down. If the sinus presents its natural appearance and the needle withdraws pure blood, the absence of the fluctuation before described would indicate that there remained little doubt of the presence of a thrombus in the bulb of the jugular vein, which may have become infected through the floor of the tympanum or from the lodgement in it of septic emboli which had formed in the sigmoid sinus, and we have then to deal with thrombophlebitis of the bulb of the jugular vein.

TREATMENT OF OTITIC PYEMIA.

Expectant treatment need only be mentioned to be condemned.

Non-surgical treatment may take the form of the administration of diuretics and purgatives, while to keep up the patient's strength, especially in the pure septicemic cases with continuous intermittent high temperature, alcoholic stimulants, quinin, ammonia and nourishing diet may be required. To counteract the toxic effect of the streptoccus or its products, injections of antistreptococcic serum may be made; and indeed, in cases of continuous septicemia, unrelieved by complete evacuation of all sources of infection, this is practically our only resource.

Surgical treatment takes its simplest form in free incision of the membrana tympani, and when this results in the evacuation of unmistakable pus, it may, especially in children, be all that is required.

Then, polypi or masses of granulations or collections of broken down desquamated epithelium in the tympanic cavities must next be removed, but in the presence of pyemic symptoms it is not justifiable in the adult to stop short at their removal, and the petro-mastoid cavities must be opened without delay.

In acute cases the mastoid cells and antrum must be freely opened; all diseased bone and granulation tissue should be carefully but thoroughly scraped away, and it is most important that the peripheral cells should be freely exposed as far as the very apex of the mastoid process. Recrudescence of fever has often been found to be due to the persistence of a focus of pus in one of the

apical cells, which has been overlooked at the first operation. This may be all that is required to bring the case to a successful termination.

In addition to the operative treatment, the patient is kept at rest and is administered diuretics, quinin, and nourishing liquid food; antistreptococcic serum is injected if the temperature does not rapidly descend to about the normal, and metastatic abscesses are opened as they form.

In some acute cases persistence of the symptoms, in spite of this treatment, may be due to this formation of parietal thrombi in the sinus or the jugular bulb; exploration and treatment, as recommended for chronic cases. is then to be carried out, including ligature of the jugular vein, incision, evacuation, and obliteration of the sigmoid sinus.

In the performance of the mastoid operation in acute cases, great care must be taken to avoid wounding the sigmoid sinus. This accident is not so insignificant as writers have hitherto taught.

In *chronic* cases, if there is well-marked evidence of thrombo-phlebitis of the jugular vein in the neck, this may be exposed and ligatured, and possibly evacuated, before the radical operation is carried out. In the absence of such evidence we proceed at once to do the radical operation, and then expose the sigmoid sinus by a continuation backward of the breach of the bone, and explore it as before described. If it is thrombosed, and there is evidence of puriform disintegration high up in the sinus, it may be freely incised, and the purulent débris completely removed with a spoon. If absolutely firm, healthy occlusive clot is then reached, the cavity may be washed out with sublimate solution, dusted freely with iodoform alone or in combination with boracic acid, and lightly plugged with iodoform gauze. The lips of the cut in the sinus may be doubled in so as to assist in the obliteration of the cavity.

(The essayist describes a case exhibited before the Otological Society of the United Kingdom.)

At the same meeting Mr. Arthur Cheatle showed a similar case of sinus thrombosis in which recovery followed an operation limited to the sinus without ligature of the jugular vein. Warnecke publishes in the *Archiv. für*

Ohrenheilkunde, March 15, 1900 (pp. 197, 198), two cases of sinus thrombosis, with connective-tissue obliteration of the sigmoid sinus, occurring in Professor Lucæ's clinic in Berlin. The clinical histories are almost identical with that of the case I have just described. The most striking results of this method of treatment are those obtained by Professor Macewen, and published in his work on the "Pyogenic Diseases of the Brain and Spinal Cord" (Glasgow, 1893, p. 331). In twenty-eight cases of infective sigmoid sinus thrombosis treated without ligature of the jugular vein, he had only eight deaths.

If firm occlusive healthy clot has not been reached, or if after the above operation repeated rigors occur, it is necessary to expose the sinus to the utmost extent in both directions, scraping away the clot until a free flow of blood take place, then obliterating the space by the introduction of iodoform gauze. Before doing this the internal jugular vein ought to be exposed and ligatured. If the vein has undergone thrombosis, the ligature should be placed as low down in the neck as possible; the upper part of the vein should be slit up and brought out through the upper angle of the wound, its contents being removed by means of cureting or very gentle syringing. If it is not thrombosed, the ligature should be placed as high as possible, the vein being left uncut; the sigmoid sinus should be then freely cleared out, the wound irrigated with perchlorid solution, dusted with iodoform, and lightly plugged with iodoform gauze, an antiseptic gauze being placed over all.

Dr. Nicoll published in the Glasgow Hospital Reports for 1889 a case in which he exposed the lateral sinus as far back as the torcular. It may also be exposed downward to the jugular bulb, and Chipault shows how the portion of bone dipping down into the hollow of the sinus may be removed.

Among other practical points, this case shows the necessity of removing the gauze tampon with as little delay as possible. Ballance says that it should not be left for more than twenty-four hours; it can, of course, be renewed if necessary.

In thrombosis of the cavernous sinus the best chance of recovery is afforded by free incision of the lateral sinus

with ligature of the jugular vein, in the hope that the clot may be dislodged and extruded through the opening in the lateral sinus.

Should the temperature be continuously high and the vital powers undergoing rapid exhaustion, antistreptococcic serum, or even normal blood serum, may be injected. The patient's strength must be kept up by means of quinin and alcoholic stimulants.

When complicated with cerebral or cerebellar abscess, the abscess should be opened through an aperture in the bone as far as possible from the sigmoid sinus.

When complicated with meningitis, lumber puncture may be performed. If there are pus cells or cocci in the fluid, no further operation should be attempted. In the absence of these the meningitis is probably of the serous form, and likely to subside after operation on the sinus.

Metastatic abscesses must be opened as they arise.

On a Universal Notation of Acoumetry.

SCHIFFERS, F., Liège. (*The Journal of Laryngology, Rhinology, and Otology*, October, 1900.) For several years attempts have been made by physicians and physiologists to invent a simple and practical acoumetric notation. The endeavor to invent a method which shall put the measurement of hearing acuity on the same level as the measurement of visual acuity is a legitimate endeavor, but it must be admitted that the problem is much more complex, and its solution is extremely difficult. Apart from the incompleteness of our knowledge of the physiology of hearing, the difficulty of the problem is increased by the fact that sound vibrations reach the perceptive apparatus by two distinct routes, the aerial and the bony. Further the principal function of the ear is to perceive articulate language. We have, therefore, to deal not only with the special sense, but also with the faculty of appreciation and analysis, the comprehension of the complex sounds of the different words which succeed one another in a phrase. How can we possibly invent a simple and trustworthy notation of these? Daily experience with children demonstrates the necessity for recognizing this faculty of perception of articulate language. In early infancy, specially, there can be no doubt that the different functions of the nerve of hearing are not in constant rap-

port with one another. How, then, can we get an exact idea of the functional disturbance from any single method of measurement, even if founded on the use of a perfect acoumeter?

The study of this question has been complicated by the fact that the different methods in use have attempted to determine the position of the lesion of functional disturbance. This mode of regarding the question ought to be given up; any way, it has given rise to numerous errors. In many cases it cannot, of itself, establish a sure diagnosis.

Conclusions.—1. The watch and all kinds of acoumeters without graduation are useless for the desired notation—that is, for a "minimal fundamental notation." Watches are not all alike in their sound; moreover, as the graduation of intensity of the sound depends on distance, it is not possible to use this method for measuring the hearing power "on contact."

2. The tuning-fork is the best instrument for measurement of hearing power. The optical method constitutes a decided step forward, and may be further perfected. It is, we believe, the simplest and most exact existing method of making a minimal acoumetric notation. It is applicable to all cases.

3. The method of noting the time during which a given tuning-fork is heard has many supporters. The tuning-fork used must be named—that is to say, the number of vibrations per second. The result would be expressed thus: R. A. c_2 256 v. $^9/_{24}$; i. e., right ear, by air-conduction, hears a fork of 256 vibrations for nine seconds, whilst a normal ear hears it twenty-four seconds.

4. Weber's experiment maintains its value.

5. Rinne's experiment, if used at all, must be modified. The foot of the fork ought to be held in front of the otoscopic tube in order to get a proper comparison between aerial and bone conduction.

6. Examination by spoken words is indispensable, specially in the case of children. Here Wolf's experiments must be kept in mind. Vowels and consonants—omitting sibilants—spoken in a whisper, using only residual air, are to be employed. A method of giving a uniform tone to the voice is a desideratum; without it all vocal measurements lack precision. In noting results the

words or letters whispered, and the distance at which they are repeated, are to be recorded.

Proposed Universal Notation of Acoumetry.

HARTMANN, ARTHUR, Berlin. (*The Journal of Laryngology, Rhinology, and Otology*, October, 1900.) Tests of hearing-power have two objects: (1) To make a diagnosis possible of the kind of disease of the organ of hearing. (2) To determine the degree of hearing-power and the results of treatment.

For diagnosis it is essential to estimate the power of hearing by air-conduction and by bone-conduction.

As all combinations of sound-waves are the resultant of simple vibrations, the latter from the true basis on which an exact estimate of auditory acuity is to be formed for diagnostic purposes.

The only instrument we possess for conveying simple sonorous vibrations to the ear, through the air and by the bone, is the tuning-fork.

Therefore, for diagnostic purposes, hearing must be tested by tuning-forks, and the duration of perception by air and by bone must be determined.

The letters L (Luft), K (Knochen), A (Aer), O (Os), A (Air), B (Bone), may be used to indicate which route is referred to.

In noting the results of tuning-fork tests, we must state the number of vibrations of the fork, as well as the name of the fork, because physicists and musicians of different countries have not yet adopted a uniform standard. Further, note should be made of the time during which the given tuning fork is heard by the normal ear.

The simplest method will be to note the duration of hearing by the diseased ear, s (sinister), or d (dexter), in the form of a fraction, of which the denominator is the duration of hearing in the normal ear, the numerator that in the diseased ear. Thus: s. c^2 512 $^{18}/_{48}$ L. (A), i. e. a tuning-fork (named c^2) of 512 vibrations is heard by the healthy ear forty-eight seconds, by the diseased left (s) ear only eighteen seconds, by air conduction.

But as the chief use of the human ear is to understand speech, this power also must also be tested. The whispered voice is used, and in noting results the words used and the distance at which they are repeated are to be noted.

Acoustic Exercises for Deaf-Mutes.

URBANTSCHITSCH, V., Vienna. (*The Journal of Laryngology, Rhinology, and Otology*, October, 1900.) The paper deals first with the importance of acoustic exercises in all cases for developing the sense of hearing, then treats of methodical acoustic exercises for deaf-mutes. In a short historical review of the subject the excellent work of French authors is referred to, but the general neglect of the subject is lamented. In consequence of some remarkable results obtained by the author with methodical acoustic exercises in 1888, trials of the method were undertaken in Viennese schools for deaf-mutes. The author next describes the method of carrying out these exercises with very young children, then with children who are being taught to speak and to read.

Examination of the hearing-power of deaf-mutes shows that often considerable remnants of hearing-power (Hörreste) are present, so that complete bilateral deafness is a rarity. On the other hand, comprehension of the sounds perceived is frequently absent; moreover, deaf-mutes show a remarkable lack of attention to sound-impressions. The object of methodical acoustic exercises is, therefore, (1) To awaken attention to acoustic impressions; (2) to build up "differential hearing;" (3) to increase acoustic excitability.

The author describes the application of the exercises to cases of very weak hearing-power and to the apparently totally deaf. Experience shows that even apparently totally deaf people ought to be tried. These exercises are not suitable for school children, on account of the great pains that must be taken and the time required.

The author then proceeds to answer several important questions.

1. What cases are suitable for methodical acoustic exercises? The exercises are always at first experimental, because the result cannot be foretold in any individual case. Success has been achieved even in deafness due to cerebro-spinal meningitis. The author is quite opposed to Bezold's view that all who cannot hear tuning-forks a^1 to b^2 should be passed over, for even in such cases he has had good results.

2. How long should the exercises be continued? The

more difficulty there is in arousing perception of sound, the more are special exercises required, whereas these may be limited or omitted whenever ordinary sounds are perceived or the deaf-mute can hear his own voice.

3. What are the results of acoustic exercises? The result of the exercises will vary with the nature and duration of the daily practice; with the amount of hearing power already present, and with its capacity for development; with the intellectual condition of the patient, and with his interest in the exercises. In some cases in which hearing-power is apparently absolutely wanting, a trace of hearing may be awakened which is capable of further development. As a general rule acoustic exercises raise the hearing power, thus a mere trace of hearing becomes a hearing of tones, this again is a hearing of vowels, words and sentences. The capacity for development of each individual case cannot, however, be estimated; it varies even in a right and a left ear which at the start were functionally equal.

4. What is the practical worth of acoustic exercises? These exercises have a favorable influence on speech, on its hardness and its modulation, and also on the possibility of learning a dialect. As his hearing-power improves social intercourse becomes easier for the deaf-mute, and at the same time the difficulty of earning his living diminishes.

Acoustic Exercises in the Education of Deaf-Mutes.

SCHWENDT, Bale. (*The Journal of Laryngology, Rhinology, and Otology*, October, 1900.) Remains of hearing-power must be taken advantage of when they are present in sufficient quantity. The patient should be able to hear vowels and a certain number of consonants. This corresponds to a hearing power for la^3 to la^4.

2. Education of the ear must not interfere with lip-reading.

3. To judge of the results of the method of the semi-deaf ought to be separated—at least as an experiment—from the deaf-mutes.

Surgical Treatment of Aural Sclerosis.

SIEBENMANN, F., Bale. (*The Journal of Laryngology, Rhinology, and Otology*, October 1900.) The question whether aural sclerosis can be treated surgically

must, at the present time, be answered in the negative. Almost all aurists who have undertaken operative treatment are agreed that good results are obtained only in dealing with conditions resulting from old suppurations and from hypertrophic catarrh, and even in these the indications for operation and the results are quite uncertain.

The pathologico-anatomic conditions found in sclerosis are in themselves enough to warn us against surgical interference. In this connection it is to be noted that v. Troeltsch's sclerosis must be sharply distinguished from (1) all forms of closure of the tube, (2) results of previous middle-ear suppurations, (3) diseases of the nervous system implicating the acousticus. To the latter belongs presbyacousis, which begin generally between the ages of forty and fifty, seldom earlier, and in which the middle ear remains free from any changes.

The juvenile form of progressive hardness of hearing generally begins in the second or third decennium of life (seldom later). This is the true (v. Troeltsch) sclerosis, and it is due to the formation of one or more centres of spongy bone in the dense bone of the labyrinthine capsule.

(a) The part most frequently and earliest effected is the wall of the labyrinth, especially the antero-superior part of the pelvis ovalis, which in the end leads to fixation of the stapes. This (fixation of stapes) is due partly to the narrowing of the recessus and fenestra ovalis by the spongy change in the bone, partly to an ossification of the ligamentum annulare. A mass of spongy bone extends, in almost all cases, forward and inward to the endosteum of the lumen of the cochlea. When not too far developed this disease presents Bezold's triad of symptoms.

(b) It is well known that isolated foci occur in all or in individval turns of the coclea, producing the symptoms of the nerve deafness. This is probably more frequently due to chemical or physical alterations of the lymph than to pressure on the nervus cochlearis. Combinations of nerve deafness and stapes anchylosis are frequent, especially in the latter stages (dysacousis of Bezold).

(c) The point from which these foci start and spread out is the intermediate zone between actual labyrinthine capsule and the bone derived from the periosteum.

(d) Surgical treatment of the labyrinthine capsule in

this disease would have to remove so much bone—even in the earliest stages at which diagnosis is possible—that a great part of the membranous labyrinth (at least in the chohlea) would be torn, opened and destroyed.

II.—NOSE.

Nasal Empyema as an Etiologic Factor in the Establishment and Continuation of Post-Nasal Catarrh and Catarrhal Inflammation of ths Middle Ear, with an Especial Consideration of the Enlargement of the Posterior End of the Middle Turbinate as a Predisposing Cause,

COBB, Boston. (*Archives of Otology*, Vol. XXIX, Nos. 2 and 3.) After going quite fully into the subject of post-nasal catarrh the author draws the following conclusions:

1. That the whole chain of catarrhal symptoms of the nose, the naso-pharynx and of the ears is due to empyema of the nasal accessory sinuses.

2. That this empyema is the result of an infective inflammation of the accessary sinuses in which the drainage is insufficient.

3. That the malformation of the posterior end of the middle turbinate plays an important part in establishing the nasal empyema which causes post-nasal catarrh.

4. That chronic catarrhal inflammation of the middle ear may result from the catarrhal condition of the naso-pharynx, either by extension of the disease, by continuity of tissue, by the forcibly blowing of the irritating secretion into the middle-ear cavity, or by closure of the eustachian tube from involvement of the mucous membrane in or around its entrance.

5. That there is no evidence that chronic catarrhal inflammation of the middle ear is caused by obstruction to nasal respiration unless the obstruction is associated with Empyema of the accessory sinuses.

6. That those cases of chronic catarrhal inflammation of the middle ear which are caused or made worse by naso-pharyngitis cannot be cured until the nasal empyema which causes the naso-pharyngitis is first cured, and that mechanical treatment directed to the ears is only palliative and does not free the patient from the danger of an acute exacerbation of the disease.

7. That many cases of nasal empyema may heal spontaneously under favorable conditions, and the more recent the case the more probable it is that this will occur.

8. That the accessory sinuses have a tendency to free themselves of inflammation and that treatment should be directed to assist nature to this end.

9. That it is possible to cure practically every case of nasal empyema and therefore every case of naso-pharyngitis depending on it. *Campbell.*

Herpes in the Course of a Pseudomembranous Diphtheria of the Nasal Passages.

VIOLLETTE. (*Gazette des Hopitaux*, No. 109, 1900.) A child, three years old, had scarlatina, followed by a persistent nasal discharge, which showed seven and a half months later diphtheria bacilli. The nasal passages at this time were filled with a false membrane. This condition was accompanied by a herpetic eruption limited to the region of one hand innervated by the radial nerve. The injection of twenty cubic centimeters of antitoxin was followed by prompt recovery. The author believes the skin affection to be due to the action of a virulent germ upon a system already debilitated by preceeding disease. The suggestion is made that cases of this sort may serve to throw light upon the origin of certain infections or epidemic forms of herpes. *Goodale.*

Primary Epithelioma of tha Autrum of the Highmore.

CURTIS, HOLBROOK. (*The Laryngoscope*, October 1900.) Case of a lady, aet 50, who complained of severe neuralgic pains for two weeks over the distribution of the fifth and seventh nerves on the left side of the face. There was pronounced pain on pressure over the antrum, but no evidence of pus in the ostium maxillare.

Transillumination showed a marked umbra of the orbit and an opaque shadow in the vicinity of the antrum of that side.

The writer trephined through the socket of the first molar and obtained a free bloody discharge intermixed with brown caseous material. Irrigation was then practiced through this opening.

Two weeks later the nose became occluded the cheek swollen and the region of the third molar alveolus became soft and broke down. Under anesthesia a large opening

was made involving the three posterior alveoli and the canine fossa. The cavity was thorougly curetted amidst a severe hemorrhage.

Scrapings of the tissue submitted to microscopic examination showed the same to be a most malignant type of epithelial cancer.

After the operation the invasion of the surrounding tissues took place with great rapidity, pushing the nasal bones to the right of the face and invading the nasal cavities of both sides.

Deglution was greatly interfered with. Six weeks after the operation the patient succumbed.

The author refers to the rarity of primary nasal epithelioma. *Seymour Oppenheimer.*

The Use of Citric Acid for the Relief of Ozena in Atrophic Rhinitis.

SOMERS LEWIS S. (*Therapeutic Gazette*, March 1900.)

The author concludes that:

1. The drug is of great value in preventing the fetid odor of atrophic rhinitis.

2. The successful action depends upon its direct application to the diseased tissues; for this reason the removal of all foreign material is absolutely necessary.

3. After its use the ozena usually remains absent from one to two days, and in exceptional cases longer, depending upon the extent and severity of the morbid process.

4. It exercises no direct action upon the morbid tissue in the direction of restoration of its normal functions.

5. Unless used at more or less regular intervals its action is but transient, and the ozena speedily becomes prominent again. .

6, To a moderate extent it inhibits scab formation.

7. Finally, citric acid is an important addition to the therapy of fetid rhinitis by enabling the rhinologist to successfully combat the chief and often only complaint of the patient—ozena.

The method of application consisted of daily insufflations of equal parts of milk sugar and citric acid finely triturated. *Seymour Oppenheimer.*

The Result of Septal Deformities Upon the Upper Respiratory Tract.

JOHNSON, E. R. M.D., Wollaston, Mass. (*The New*

England Medical Gazette, September, 1900.) Most septal malformations are caused by traumatism, usually received in childhood, but not discovered until later in life. The symptoms resulting from the same are described in detail, special prominence being given to those reflex disturbances which occur secondarily. Spurs, ridges, or decided thickenings are to be removed with the saw or knife. For deflections, the Asch operation is preferred, and the details for its performance are given. *Richards.*

Hypertrophy of the Pharyngeal Tonsil. Its Anatomy and Physiology.

PIERCE, NORVAL H., Chicago. (*Journal of the A. M. A.*, Nov. 3, 1900.) The pharyngeal tonsil develops at an early age, probably coincident with the faucial tonsils, and its ultimate nature is as much unknown, It is composed of lymphoid tissue, the round cells of which are indistinguishable from embryologic connective tissue and lymph nodes. These are held together with the blood vessels and nerves, by a reticulum of connective tissue, which has a great deal to do with the involution of the organ after hypertrophy. In process of time the embryologic tissue contracts, the lymph nodes are squeezed, their blood supply diminished and atrophy, or shrinkage, follows. Tho tonsil is covered with ciliated columnar epithelium as a rule, sometimes with squamous or cuboidal. Adenoids are hypertrophies of this normal tissue, and are most often caused by a succession of attacks of acute inflammation. The infectious diseases, such as measles, scarlet fever, etc., play an active part in the causation of this condition. They have been divided into three varieties, scrofulous, tuberculous and syphilitic: this classification does not embrace all cases. It is probable that there is a somewhat close relationship between adenoid tissue and tuberculosis. *Richards.*

The Physiognomy of Chronic Pulmonary Tuberculosis, a Characteristic Peculiarity in the Appearance of the Nose.

SHIVLEY, HENRY L. (*Philadelphia Med. Jour.*, September 1, 1900,) The author has noticed in cases of incipient tuberculosis that there occurs a pinched nose of peculiar waxey pallor, against which the brownish yellow orifices of the sebaceous ducts stand out in marked relief. The appearance is most noticeable at the tip and

lower third of the nose, and in rare instances is also present on the chin. The appearance is not constant, but occurs sufficiently often to have some diagnostic value.

Richards.

Modes of Infection of the Maxillary Sinus.

CRYER, H. M., M. D., D. D. S., Philadelphia. (*Jour. of the A. M. A.*, Nov. 24, 1900.) This is another of Dr. Cryer's valuable anatomic papers, illustrated by many dissections of his own, and the reader is referred to the original article itself, since it is impossible to properly abstract it without a reproduction of the pictures.

Richards.

The Importance of Preliminary Treatment for Intra-Nasal Operations.

SEILER, CARL, M D., Scranton, Pa. (*Medical Record*, October 27, 1900.) The writer makes a plea for the careful and thorough preliminary treatment of the nose with simple washes and stimulant applications, in order to render the nasal mucous membrane as nearly normal as possible before doing any operation upon it. The time required for the preliminary treatment will be well spent, the healing process being rendered more rapid and more satisfactory.

Professor Seiler states that many of the antiseptic pastiles which are sold under his name are not satisfactory, being frequently inefficient and in many instances even injurious, and he has been compelled to request the numerous manufacturers to withdraw his name from their preparation labels.

He regards what he calls the natural method of cleansing the nose one of the most efficient. "It consists of placing two ounces of the blood-warm cleansing solution in a small tumbler or cup, placing the end of the nose within the rim of the tilted vessel until the liquid enters the nostrils, then closing the mouth, and by a moderate inspiratory effort drawing the solution into the nose and naso-pharynx, thus bringing it in contact with all parts of the nasal mucous membrane. The vessel should then be quickly removed from the nose and the liquid within the nasal cavities be blown out through both nostrils at once, and the process repeated until the liquid in the vessel is exhausted."

Richards.

Pseudo-Hemoptysis Arising in the Naso-Pharynx.

BOTEY, RICHARDO, Barcelona. (*The Journal of Laryngology, Rhinology, and Otology*, November, 1900.) In six years the author has seen a score of cases of this kind, and was surprised that our special literature took so little notice of the subject.

He excluded all cases in which hemorrhage in the cavum was due to ulcer, malignant tumor, or traumatism. According to the literature, hemorrhages from the upper respiratory tract, which simulated hemoptysis, always arose from the larynx or a varix of the lingual tonsil. The author on the other hand, maintained that in almost all cases the cause of these false hemoptyses was to be sought in the naso-pharynx. The larynx and lingual tonsil were seldom at fault.

Dr. Botey cited six of his cases in support of his position. The patient always coughed but little, but in spite was frequently bloodstained; examination of nose, pharynx, larynx, root of tongue, and chest gave negative results.

If one examined the patient during an attack one saw the blood trickle down the posterior pharyngeal wall from behind the soft palate.

A swab introduced into the naso-pharynx would often induce an attack, and in any case would be stained with blood.

The author pointed out that from its position and structure the mucosa of the naso-pharynx was eminently liable to small hemorrhages. A slight superficial erosion was sufficient to produce hemorrhage from the almost unprotected superficial vessels. Such a hemorrhage would be stopped by the formation of a small clot; but this clot, being dried by the respiratory current, was apt to fall off, and so recurrent hemorrhages were produced.

Dr. Botey had frequently seen these small black clots on Luschka's tonsil, but more frequently between that and Rosenmüller's fossae. By touching one with the point of a probe he had produced hemorrhage, and so convinced himself of the naso-pharyngeal origin of pseudo-hemoptysis.

A New Method of Treating Nasal and Naso-Pharyngeal Affections by the Application of Hot Air.

LERMOYEZ, M., DR., and MAHN, G., DR., Paris. (*The*

Journal of Laryngology, Rhinology, and Otology, November, 1900.) Hot air had been used in the treatment of diseases of the upper respiratory passages only in the form of inhalations in which the air was moist and scarcely raised in temperature above that of the surrounding atmosphere. The authors applied currents of superheated dry air (80° to 100° C.) to limited areas of the mucous membrane, a method similiar to that employed by Holländer and Jayle in dermatology and gynecology.

The air was obtained from steel cylinders, in which it was stored under a pressure of 120 atmospheres, was heated in a metal serpentine tube, and led to its destination in a protected flexible metal tube. To the latter were adjusted various cannulæ of different sizes and shapes, suitable for applying the air to the inferior turbinals, to the orifices of the Eustachian tubes, or to the ears. At the base of each cannula was an arrangement for regulating temperature and pressure.

The air was applied under guidance of the eye, with speculum and frontal mirror. A sitting lasted two minutes, and was repeated two or three times a week. As a rule from eight to twelve sittings were necessary to obtain good results. The treatment was absolutely painless. On applying the hot current there was at first intense retraction of the mucous membrane, quickly followed by a free aqueous secretion (defensive) which ceased after a few seconds. The good effect was manifest at once. At first only temporary, it tended to become permanent.

This treatment had been most beneficial in chronic congestive coryza with intermittent nasal obstruction. The results were remarkable and lasting if there was no angiomatus degeneration of the pituitary membrane. Sneezing and other nervovs symptoms of spasmodic coryza soon ceased. The discharge of nasal hydorrhea dried up, and the mucous membrane returned to a normal (objective) condition. The only effect on hay fever was that the intensity of the crisis was diminished.

Lastly, good effects were obtained in ear troubles (deafness, tinnitus) accompanying nasal and naso-pharyngeal catarrh. Otalgia yielded to the treatment almost immediately.

This treatment was not a panacea for all nasal affections.

The authors had found it useless in ozena, purulent catarrh, nasal lupus, true hypertrophic rhinitis, and all affections of nose and naso-pharynx requiring surgical treatment.

On the Importance of Auto-intoxication in Periodic and Aperiodic Coryza. Therapetic Deduations. Eleven Cases.

MONIER, Paris. (*The Journal of Laryngology. Rhinology, and Ololy*, November, 1900.) The author had had the opportunity of watching carefully for several years a case of spasmodic rhino-bronchitis with paroxysms in May. He had obtained a cure in a few weeks by simple dieting.

The other ten cases, which were cured or much improved by the same treatment, confirmed the importance of auto-intoxication (gastro-intestinal) in both forms of spasmodic coryza.

The elimination of toxins by the pituitary membrane and by the glands of the respiratory tract explained:

1. The crisis of aperiodic coryza.
2. The extreme susceptability of the nasal and bronchial mucosa to external irritants in pure periodic coryza.

Careful dieting ought therofore to be the foundation of all treatment, and should be combined with certain medicines as adjuvants) strychnin and benzo-naphthol).

Surgical treatment of the inferior turbinals, of malformation of the septum nasi, or of hypertrophied tissue in the naso-pharynx, was not to be neglected, specially in hay fever.

Treatment of Deflections of the Septum.

MOURE, E. J. (*The Journal of Laryngology, Rhinology, and Otology*, November, 1900.) Of all operations for deflections of the septum, that described by Asch seemed to be the most successful. It consisted in making a cruciform incision through the most prominent part of the deflection. Thus, four plates were formed, which were pushed through to the opposite side of the nose by means of a dilator. The author thought that this operation was not applicable to all cases, and he often had great difficulty in keeping Asch's tube in position. Dr. Moure's operation was quite different from Asch's. When there was a spur or thickening of the fibro-cartilage at the seat of the deflection—which was frequently the case—he first removed the ridge and shaved the septum *till nothing but the*

deflection was left. Allowing time for this to heal completely—i. e., generally about one month—he proceeded as follows:

"Both sides of the septum are cocainized. An incision is made along the line of insertion of the septum, parallel to the floor of the nose, extending from just behind the vestibular portion of the septum to the vomer. A second incision is carried along the bridge of the nose, and is about as long as the first. A triangular plate is thus obtained, adherent in front at the vestibule, and behind at its insertion into perpendicular plate and vomer. This plate, as one would imagine, is very flexible. A special dilator —consisting of two parallel blades, the outer of which is rigid and fixed, while the inner is large and made of soft metal—is passed along the convex side of the septum, and the septum is pushed toward the opposite side by means of forceps, constructed *ad hoc*, passed into the dilator. By this means the flexible median plate of the dilator, and through it the septum, is forced to assume the desired position and shape. The dilator is left in position seven or eight days, till complete union of the parts has taken place in the new position. During the first forty-eight hours the nose should be bathed with sterile boracic acid solution, as there is apt to be a more or less intense inflammatory reaction. Thereafter the nose should be syringed occasionally to prevent the accumulation of crusts in the nasal cavities. As there is no suppuration, no local treatment is required. After eight days the apparatus is removed. Generally both the septum and the bridge of the nose are found quite straight."

Dr. Moure had made use of this operation for more than two years, and had always had excellent results *in adults.*

For children it was not so suitable, on account of the pain produced, and also of the difficulty of keeping the diltor in position. In the author's opinion, however, this was no drawback to his operation, because no operation ought to be done on the septum till the skeleton of the nose had reached its full development.

Pulmonary Emphysema Due to Experimental Nasal Obstruction.

COUSTEAU, Paris. (*The Journal of Laryngology, Rhinology, and Otology*, November, 1900.) Young rabbits

were experimented on. One nostril was obliterated, and the rabbits were killed seven months later. The lungs presented very clear evidences of pulmonary emphysema. On the lungs were seen whitish raised plaques, presenting here and there little transparent vessicles of the size of a small pin's head. Microscopic examination was still more conclusive. The alveolar walls were thinned and even burst in places, thus forming lacune of greater or less size according to the number of alveoli that had yielded.

A similar result was obtained in twelve days by obliterating both nostrils in a rabbit.

The author wished to draw attention to the importance of maintaining the premeability of the nose, considering the rapidity with which stenosis (even incomplete) of the nose could give rise to pulmonary emphysema.

Palpation of the Maxillary Antrum and Endo-Nasal Operation for Antral Empyema.

KASPIRANT, DR., Moscow. (*The Journal of Laryngology, Rhinology, and Otology*, November, 1900.) Diagnosis by palpation was carried on by pressing a right angled probe in front and behind the processus uncinatus, so as to force the pus through the osteum maxillare in drops or even in jets.

Endo-nasal Operation.—The wall of the maxillary antrum was cut with a special knife, in front and behind the processus uncinatus: the processus uncinatus was cut away with a conchotome; after this followed rescetion of the lower part of the interior osseous wall of the antrum, along with the median portion of the internal turbinal. This was done with special cutting forceps.

Of the 34 cases operated upon, 31 were complete cures.

The Surgery of the Sinus of the Face in Relation to the Surgery of the Orbit.

LAURENS, G., Paris. (*The Journal of Laryngology, Rhinology, and Otology.* The author first discusses the anatomical, clinical and operative relations of the nasal accessory cavities to the orbits. He had operated on five cases of ethmoidal or fronto-ethmoidal sinusitis with orbital fistula and consequent phlegmon. They had all been frequently treated before. In all he obtained a radical cure by the following operation:

A long, curved incision, starting at the end of the eye-

brow, encircling the root of the nose, and ending a little to the inside of the internal commissure. Section down to the bone of all soft parts. Careful hemostasis of the peri-orbital arterio-venous circle; resection of the supra-orbital nerve. Then all the organs (muscles, ligaments, pulley of oblique muscle, etc.) attached to the internal wall were to be detached, and the eyeball gently passed outward. Care should be taken to avoid the anterior ethmoidal artery, which marked the upper limit of the field of operation with the gouge; operating higher up involved the risk of opening the cranial cavity. One had thus exposed to view the lamina papyracea (often carious) of the ethmoid. It was broken through with a curette, and thus free access to the whole of the anterior ethmoidal cells obtained. By this route the fronto-nasal duct could be exposed, and consequently the frontal sinus. If the latter was affected, and had been trephined several times already, the best method was to break down the whole anterior wall. In three cases M. Laurens had had to resect a large part of the superciliary arch and of the roof of the orbit to reach deep diverticula. The author always drained through the orbit if there was no pus in the nose.

The esthetic result was perfect in case of ethmoidal fistula, the cicatrix, largely hidden by the eyebrow, being scarcely visible. After resection of the roof of the orbit there was always a more or less pronounced depression. The author had never seen oculomotor troubles or strabismus after the operation.

Painful Recurrent Catarrh of the Frontal Sinus, Due to Stenosis of the Fronto-Nasal Duct.

LUC, Paris. (*The Journal of Laryngology, Rhinology, and Otology*, November, 1900.) In the two cases here reported the author had noticed the following group of symptoms: Pain, along with tenderness on pressure and sometimes swelling in one-half of the forehead, accompanied every coryza a frigore. It was always in the same side of the forehead. The pain occurred in crises, each crisis lasting several days and ceasing on the expulsion of a variable quantity of muco-pus.

In the first case the narrowness of the fronto-nasal duct —the cause of all the trouble—seemed to be congenital, and the affection, which was catarrhal at first, ultimately became a chronic empyema.

In the second case the fronto-nasal stricture seemed to date from an operation on the affected, sinus, in which oporation no systemic dilatation of the duct had been carried out.

Both cases were cured by operation. After opening and cleansing the sinus, the fronto-nasal duct was enlarged by destruction of the nasal portion of the floor of the sinus, and of the anterior ethmoidal cells.

On the Radical Operation for Chronic Multiple Sinusitis.

TAPTAS, Constantinople. (*The Jonrnal of Laryngology, Rhinology, and Otology*, November, 1900.) The author describes an operation for cases of combined frontal ethmoidal and sphenoidal empyema.

The ordinary incision used in Luc's operation was prolonged downward in the middle line of the nose to the lower third of the nasal bone. Then the frontal sinus was opened through its anterior wall, and the bone of the floor of the sinus and part of the nasal process of the supeaior maxillary bone were cut away and with fine forceps.

Thus an opening was made, extending high enough to permit thorough curettage of the frontal sinus, while its lower half was on the level of the ethmoid mass and sphenoid sinus. A curette or fine conchotome passed through this part of the opening next removed the whole ethmoid mass, and entered the sphenoid sinus at a depth of 5 to 6 centimeters from the external opening. The operation was finished as in Dr. Luc's method.

In cases of very large frontal sinuses, where a large piece of the anterior wall had to be removed in order to to allow of thorough curettage, much post-operative deformity could be avoided by making, instead of one very large, two moderate sized openings, with a bridge of bone between them.

Contribution to the Study of Nasal Tuberculosis.

TEXIER, Nants, and BAR, Nice. (*The Journal of Laryngology, Rhinology, and Otology*, November, 1900.) Nasal tuberculosis was not a common affection, and primary nasal tuberculosis was rare.

The authors reported three cases, in one of which microscopic examination had confirmed the diagnosis. All three had not been published before, and could therefore be added to the small number (about seventy) of published cases.

The symptomatology of this affection was quite precise. Three forms might be described: (1) a pseudo-polypoid form, (2) an ulcerating form, and (3) a granular form (Chiari). It was not to be confused with lupus or tertiary syphilis of the nose. Prognosis depended on the general health and on the form of the local affection.

The only effective local treatment was curettage, followed by the application of 80 per cent. solution of lactic acid. Special attention must be given to the general health.

CASE I. was a primary, pseudo-polypoid form, with no antecedent tubercular lesions.

CASE II. was a secondary pseudo-polypoid or pseudo-edematous form, accompanied by military granulations in the posterior third of the nasal fosse and the pharynx.

CASE III. was an ulcerating form, limited to the vestibule of the nose. The ulceration was irregular and extremely painful.

The lesions were thoroughly curetted and treated with lactic acid, and all healed sooner or later.

Etiology and Prognosis of Adenoids.

CORWIN, A. M., M. D., Chicago. (*Journal of the A. M. A.*, Nov. 10, 1900.) The current impression that adenoids disappear at the age of puberty is due as much to the increased size of the pharyngeal cavity which takes place at that time as to the retrograde metamorphosis of the lymphoid hypertrophy itself.

A changeable climate, with relatively great humidity causes sudden congestions; this favors the growth of the adenoid tissue, whereas, in warm, dry climates this trouble is comparatively infrequent.

The lymphatic temperament, struma and the rheumatic diathesis are predisposing factors. The symptoms which are present when the growth is of sufficient size to cause trouble are detailed, the prognosis from a standpoint of non-interference being regarded as unfavorable, and the question is then asked, "Do all adenoid hypertrophies require removal?" and the same answered in the negative. In those cases in which the enlargement is slight or moderate, and there is no history of past trouble of serious import and no positive symptoms of present trouble with that as the cause, there is no call for operative interference. In the case of a child nearing puberty, with glands of a

considerable size, but showing slight or moderate functional disturbance, one should not wait for the probable spontaneous subsidence of the growth with advancing adolescence. Operation should always be done whenever the hearing is affected. Recurrence practically never happens. As a rule, even in the case of incomplete removal, there is a gradual atrophy and finally disappearance of any remnants, although it may occasionally happen that the remaining portions of the growth will cause a rapid growth of more of the tissue, with a return of the trouble, hence complete removal is the better practice.

In proportion to the large number operated upon the danger from surgical interference is quite remote although deaths have occurred in the operation and from secondary hemorrhage. "Death from the general anesthetic is among the immediate sources of anxiety whether the agent be chloroform or bromid of ethyl the two most recommended." Ordinary measures for surgical cleanliness are to be employed to prevent infection of the wound at the time of operation. *Richards.*

Anesthesia in Children with Adenoids, and in the Adenoid Operation, with Special Reference to the Dangers of Chloroform in Children of the Lymphatic Diathes s.

HALSTEAD, T. H., M. D., Syracuse, N. Y. Children suffering from adenoids are in depressed general health, have weak hearts, impoverished blood, impaired lungs, and resist disease or shock with much less force than do other children.

Contrary to the general belief that chloroform is safe in children, it is especially dangerous during the period of early childhood. According to the researches of Kolisko, who has for many years done about six autopsies per year on persons dying from cardiac syncope due to chloroform, the condition known as the "habitus lymphaticus" is always present; hence, patients of the lymphatic temperament or those in whom there is previous heart disease, or lymphatic enlargements or adenoids should not be operated upon under chloroform.

Wyeth regards chloroform as especially dangerous under twelve years of age, mainly, the author thinks, because

the lymphatic diathesis is most marked before this age.

In the adenoid operation, thoroughness is very important, and the operation should be done with the least amount of pain, shock or hemorrhage. It should always be done under an anesthetic, since without general anesthesia thorough removal of the growths in children under twelve is very difficult if not impossible, and the pain and loss of blood are liable to produce great shock and do irreparable injury to the nervous system of a sensative child. Cocain is entirely inefficient, owing to its inability to penetrate deeply enough.

Careful searching of the records and personal conversations reveal the fact that there have been many deaths from chloroform in this operation. Nitrous oxid gas is unsatisfactory as a rule, owing to the fact that the patient recovers from it too rapidly to permit the thorough operation, especially if adenoids and tonsils are to be operated upon at one sitting. Ethyl bromid is mentioned only to condemn it, and ether is recommended as the best anesthetic for the adenoid and tonsil operation, notwithstanding certain disadvantages which it has compared with chloroform; these are as nothing in consideration of the greater safety it affords.

The author recommends that the nasal mucous membrane be sprayed with cocain prior to the administration of the ether, and that a hypodermic injection of $^1/_{300}$ to $^1/_{100}$ grain of atropin be given. The excessive secretion of mucous in the pharynx, trachea and bronchi is lessened by the atropin, and the cocain reduces the stimulation of the pneumogastric and inhibitory respiratory centre.

[In the discussion which followed the reading of this paper, a case of death from chloroform anesthesia was cited by the physician in whose practice it occurred, and several other instances given, showing the dangers of chloroform for this operation. The reviewer himself has once been badly frightened in an operation for adenoids where chloroform was used, and has absolutely discontinued it so for as the operation is concerned.]

Richards.

Treatment of Maxillary, Ethmoidal, and Frontal Sinusitis.

VACHER. (*The Journal of Laryngology, Rhinology, and Otology*, November, 1900.) Empyema of the ethmoid

cells seldom existed alone, but was generally combined with empyema of the frontal sinus or the maxillary antrum. Sometimes the sphenoid sinus was also affected. Patients suffering from these diseases were divisible into two classes, viz., those who would and those who would not submit to external operation. The author discussed the treatment of the latter class only. First a clear view of the parts must be obtained by removing the inferior turbinal and the anterior end of the middle turbinal bodies (the latter by cold or hot snare, or Grunwald's forceps, cutting without either tortion or dragging).

Plenty of time was required, sitting at sufficient intervals to allow the patient to recover from pain, shock, loss of blood, etc. Curettage of the middle meatus, opening each cell of the ethmoid mass, so as to form one cavity easily accessible for swabbing or irrigating. If the frontal sinus were affected it should be probed and irrigated, the entrance to it enlarged as much as possible to permit the application of caustic installations, etc. If the maxillary antrum were affected and the patient refused to have it opened through the canine fossa, its internal wall was to be removed. For this purpose the author used a special pair of scissors. He first plugged the correspoding posterior naris, and held the plug in position by a thin wire—a thread might easily be accidentally cut during the operation. The opening in the external nasal wall ought to be as large as possible to permit of curetting, swabbing with chlorid of zine, and irrigation (twice daily).

Great improvement, if not cure, was obtained by this method in those people who refused external operation.

III.—MOUTH AND PHARYNX.

Some Observations Upon tho Common Diseases of the Throat and of the Naso- and Oro-Pharynx.

MURARY, GILBERT D. (*The Laryngoscope*, October 1900.) Conclusions:

1. That the teeth should receive attention from infancy.

2. That the mouth is the primary cause of many throat troubles.

3. That there is a quality of mildly offensive breath

which arises from micro-organisms present in the mouth, throat, naso-, and oro-pharynx.

4. That bad breath in the mouth particularly before meals suggests infection of the tonsils, naso- and oro-pharynx.

5. Diseased tonsils, not necessarily enlarged and often hidden, no longer acts as a barrier to disease but rather as a germ incubator, and the diseased outer surface should be removed.

6. That the term rheumatic sore throat should be used with less freedom.

7. That the vicious habit of a mother tasting her child's food before giving it should be preached against.

8. For the same reason all instruments, drinking utensils should be carefully cleansed before use.

9. That the coating of the tongue, which is often local in origin, should be removed as systematically as the tartar from the teeth. *Seymour Oppenheimer.*

Bloodless Enucleation of the Tonsils Under Local Anesthesia.

FRY, ROYCE D. M.D., Cleveland. (*Cleveland Jour. of Medicine*, March 1900. The author enucleates, "shells out" the tonsil from the surrounding tissue whenever the tonsil is adhesive to the pillars of the fauces or subpalatine space when the tonsils do not project beyond the pillars and in all adult cases where other methods have failed. Enucleation consumes more time, thirty minutes to a tonsil, and sometimes causes severe retching. The instruments used are a long-handled tongue-depressor, curved scissors, curved and straight forceps, enucleator and Bosworth's snare. The scissors are eight inch, sharp-pointed, and gradually curved on the flat for 1 1/4 inches to an angle of 45 degrees; the forceps are 8 inches spring-blade, mouse-toothed, and curved on the edge for three-fourths of an inch to fifty degrees.

The tonsil is exposed by the patient depressing his tongue, and is caught by the curved forceps, in its upper portion, and slightly pulled inward and forward, thus putting the mucous membrane covering the toncil and posterior pillar on the stretch, which membrane is then slit from above downward, parallel to and one-eigth of an inch anterior to the edge of the pillar. A second parallel slit is made over the tonsil, posterior to the anterior

pillar; these slits are joined above and below by oval cuts, care being taken not to encroach on the normal arch. The mucous membrane is then stripped off from the tonsil, and when the operation is completed, it folds over the edges of the pillars, and thus facilitates the healing process. The upper end of the tonsil is first loosened, this at times fills the subpalatine space, extending fully one-half inch above the arch connecting the pillars.

Great care should be used not to cut or tear the capsule of the tonsil: this will not occur if the tonsil enucleator is used.

Occasionally a large vessel is found entering high up on the tonsil, which may be caught with artery forceps and then cut.

Torsion controls the hemorrhage. Normally the vessels enter externally and in the lower-half of the tonsil. This shelling-out process should be continued until the tonsil is thoroughly loosened from its surroundings, leaving nothing but the vessels, around which the snare wire is applied.

The application of the snare requires great care in order to include the entire gland. The tonsil is pulled into the loop by a pair of lock forceps, which are not loosened until the tonsil is removed.

One end of the wire is fastened to the instrumsnt before it is introduced into the mouth, the other end is fastened after the loop has been tightened about the gland; otherwise the capacity of the instrument may not be sufficient to draw the loop completely into the canula; a very annoying accident. If any tender or bleeding points make their appearance during the operation, an application of cocain or the dessicated suprarenals will control them."

In over forty cases operated upon, he has had neither primary nor secondary hemorrhage. In no case has the oozing exceeded one-half ounce.

Only one tonsil is removed at a sitting, on account of the cocain effects. The results have been thus far satisfactory. *Richards.*

The Importance of the Upper Portion of the Tonsil and of the Supra-Tonsillar Fossa in the Etiology of Phlegmonous Peritonsilitis. Extirpation of the Upper Half of the Tonsil the Only Effectui Preventative.

BOTEY, RICARDO, M: D., Barcelona. (*The Journal of*

Laryngology, Rhinology, and Otology, November, 1900.) Dr. Botey remarked that one often met with patients who had two or three attacks of peritonsillitis yearly, and that one was apt to treat each attack without taking measures to prevent recurrence. Tonsillotomy, morcellement, ignipuncture were frequently resorted to, but though these methods hindered, they did not prevent recurrences.

Peritonsillar abscesses arose from purulent inflammation of the crypts of the tonsil spreading to the supra-tonsillar fossa, which extended to a depth of more than a centimetre, and often had its orifice closed by adhesions. Apart from those cases in which the tonsil was atrophied and adherent to the pillars, to the plica triangularis, to the margo semilunaris, or to the walls of the fossa, in most cases it was easy to separate the gland sufficiently to cut away its upper half, thus leaving the supra-tonsillar fossa free and widely open. Radical enucleation of the upper half of the gland was the only reliable treatment.

The operation was carried out in the following manner: After thorough cocainization of the tonsil and all surrounding parts, the upper half of the tonsil was freed from the pillars, etc., with a small, probe-pointed knife, seized with special vulsellum forceps, and cut off obliquely either with a galvano-caustic snare or with a curved knife. Under certain circumstances—e. g., when there were numerous deep adhesions or when the tonsil itself was of small size—the operation was apt to be difficult, or at least tedious.

In certain cases, indeed, owing to the adhesions, the upper portion of the tonsil could not be extirpated. In these a special procedure was required. Two incisions should be made from below upward, one between the anterior pillar and tonsil, the other between tonsil and posterior pillar, extending up into the soft palate. The tonsil was then to be dragged toward the median line, and the two vertical incisions joined by a horizontal incision a few millimetres above the margo semilunaris; lastly the upper part of the tonsil was dissected away with curved scissors. A cicatrix was left; but as the crypts had disappeared, no recurrence of peritonsilitis was to be feared. Hemorrhage was slight as a rule.

The Atrophic Pharynx.

SEISS, RALPH W., M. D., Philadelphia. (*Journal of the A. M. A.*, October 13, 1900.) Years of throat fretting, dryness, itching, tickling and resultant cough form the clinical history. The appearances are characteristic. Treatment is limited to palliation and perhaps arrest of progress, no absolute cure being possible, since fibrous tissue never returns to a normal condition, although treatment which is stimulative and alterative does considerable good. Thymol solution in alcohol and glycerin, tincture of sanguinaria and glycerin, and copper sulphate with massage of the surface by a medicated mop are recommended. The faradic current is regarded as the best method of massage, the positive pole being applied to the pharynx while the negative is held in the hand. Powders, caustics and astringments are condemned. Internal medication does not appear to be of benefit so far as altering the diseased throat is concerned, but may be useful in improving the general conditions. Patients should be frankly told that their condition is not definitably curable.

Richards.

IV.—LARYNX.

Cold Pre-Laryngeal Abscess of Glandular Origin.

MORESTIN. (*Gazette des Hopitaux*, No. 119, 1900.) Two cases are reported.

I. A boy, 16 years old, presented a rounded fluctuating swelling, about the size of a small orange, immediately anterior to the larynx and adherent to it. In the vicinity there was a tubercular suppurating lymph gland. The larynx appeared normal. Incision into the swellings with free curetting was followed by prompt recovery. Inoculation of the pus from both places into guinea pigs produced typical lesions of tuberculosis.

II. A man, with extensive pulmonary tuberculosis, exhibited a fluctuating, egg-sized swelling over the anterior surface of the larynx. The abscess was opened and death followed shortly after from exhaustion. No positive proof was obtained as to the point of origin of the abscess, but a tubercular lymph gland was considered by the author as the most probable source. *Goodale.*

A Contribution to the Treatment of Laryngeal Tuberculosis.

IMHOFER. (*Prag. Medic. Wochnschr.*, Nos. 40 and 41, 1900.) The author gives in detail the method of treatment in use in Krause's clinic and states his conclusions as follows:

1. Surgical treatment of laryngeal tuberculosis is the most successful treatment.
2. A poor general condition or advanced local involvement does not constitute contraindications.
3. No danger can ensue to the patient.
4. Laryngeal phthisis is curable even in advanced stages.

Goodale.

Primary Carcinoma of the Larynx.

FARRELL, T. H. (*The Laryngoscope*, October, 1900.) A case of a man, aet. 54, who had had pain on swallowing for three months, and had lost about forty pounds in weight prior to examination. Laryngoscopic examination showed a grayish fungus growth confined to the left side and involving the margin of the epiglottis, aryepiglottidean fold, arytenoid cartilage and glosso-epiglottic fold. The voice was unimpaired and the glandular structures apparently uninvolved.

Microscopic examination of excised mass showed some to be a typically cellular epithelioma.

Operation consisted of a low tracheotomy and insertion of a Gerster tampon canula through which the chloroform was administered. A longitudonal incision was made from which the hyoid bone to the fourth ring of the trachea in the median line and a transverse incision along the line of the hyoid bone. A thyrotomy was also performed in order that the growth could be completely enucleated.

The cut edges of the thyroid cartilages were subsequently sutured together and the skin flaps brought into place and sutured except at one point where a catheter was inserted in the esophagus. The Gerster's apparatus was withdrawn and an ordinary tracheotomy tube introduced.

The patient made a comparatively uneventful recovery.

Six months after operation recurrence of the growth appeared in the cervical glands on the left side, the larynx however at that time remaining perfectly free.

Difficulty in swallowing solid foods is manifested by the

patient but the motion of the vocal cords is good, giving a very fair voice.

The writer refers to the advisability of a preliminary tracheotomy, the comparative harmlessness of a thyrotomy, associated with other extensive operative procedures, the importance of skilled nursing and the advantage of the cooperation of the general surgeon.

Seymour Oppenheimer.

Papillomata of Larynx in Children.

DICKERMAN, EDWARD T., M. D., Chicago. (*Journal of the A. M. A.*, Oct. 27, 1900.) The disease, while the most frequent neoplasms found in the larynx of children, is fortunately rare, Rosenberg, of Berlin, finding 16 cases in 5808 children under 13 years of age, that is, one in 363 cases examined; and Schröetter had a ratio of 1 in 700.

The author has found 1 in every 1200 cases in his own clinic. He reports five cases:

CASE 1. Child of six years, general condition poor. Nearly entire cavity of the larynx filled with a cauliflower growth of a pale grayish color. Tracheotomy was done for the relief of the dyspnea, and five days later, a thyrotomy. The growth was found attached to the false and true cords and extending up on the inner side to the ary-epiglottic fold, and was removed with scissors and curette, and the base cauterized with chromoic acid. At the end of four weeks the tracheotomy tube was removed. The growth recurred five months later, when tracheotomy was again done.

CASE 2. Boy of nine years with voice gradually failing. A lobulated growth was found springing from the under side and free edge of the left cord and at the angle extending across to the right cord. It was removed with a snare, five operations being done in seven months and the last operation was followed with a five per cent. solution of salicylic acid in alcohol, to which was added three per cent. of resorcin, and this was applied daily.

The larynx has been free for two years and the voice good.

CASE 3. Girl of five with warty growth filling in the anterior two-thirds of the glottis. Tracheotomy done for dyspnea, and pieces of the growth removed with snare and sponge. Tube worn for six months. Growth entirely disappeared; no recurrence has taken place.

CASE 4. Boy of two years, with posterior surface of the larynx covered with a papillomatous growth. Tracheotomy performed on account of dyspnea. Growth is growing smaller. No endolaryngeal treatment.

CASE 5. Girl of four years, sent to the hospital on account of dyspnea. Larynx filled with cauliflower-like growth. At the hospital child began to cry, became cyanotic and was dead before tracheotomy could be done. Examination of the larynx showed that the deep inspiratory effort had wedged the growth in the chink of the glottis, asphyxiating the child.

Occurring in the first year of child life, papilloma is generally multiple, pale grey-white in appearance, and springs from the true and false cords, although the whole laryngeal surface may be involved. Later, it may be single or lobulated, and usually makes its appearance in the anterior half of the larynx on the true cords.

A rough, hoarse voice or loss of voice; harsh annoying cough, distressing inspiratory dyspnea, with retracted chest walls and shallow breathing, constitute the clinical picture. The laryngoscopic examination may be very difficult.

For cases in which the dyspnea is not marked, rest in bed, absolute rest of the larynx, and a tonic may be tried. Locally, the author has found that salicylic acid with resorcin, as mentioned above, to be of benefit. Operative treatment may consist of laryngtomy; tracheotomy, with or without intralaryngeal procedures; and intralaryngeal operations. For intralaryngeal operations the author used Krause's small pincet forceps and a snare, following it up every day with the salicylic acid in alcohol with resorcin application.

Spontaneous cure will occur in a certain number of cases, and intralaryngeal methods should always be tried first unless the dyspnea is pronounced, when tracheotomy should be done at once and the tracheotomy tube worn for six months after the growth has disappeared.

Richards.

Unusual Papillomatous Growth in the Larynx.

GIBB, JOSEPH S., M. D., Philadelphia. (*Journal of the A. M. A.*, Oct. 27, 1900.) Man aged 53, previous good health, complaining of slight hoarseness. A pearly-white

deposit was found extending to the base of the left arytenoid body in the lateral wall of the larynx down to, but not involving the true cord of that side, and consisting of an innumerable number of fine filaments closely packed together, presenting an appearance not unlike that of mycosis in the pharynx. There was little encroachment upon the lumen of the laryngeal cavity. But little change took place in the growth for two years, at the end of which time it was found to be increasing in extent and bulk; there was a good deal of dyspnea, coughing, emaciation and inability to sleep. Tracheotomy was done under eucain. There was difficulty found in doing the operation on account of the depth of the trachea. The ordinary trachetomy tube could not be worn. The third day there was a purulent discharge from the tube, with high temperature, followed by death on the fourth day.

The growth was found to almost entirely cover the arytenoids, and the lumen of the larynx was encroached upon to such an extent as to barely admit a crow's quill. It obliterated all the normal tissues of the larynx on the left side, and all but the anterior third on right side. The growth was whitish in color, soft and fragile, breaking down upon the slightest touch with the probe. Pathologically, it was found to be a benign epithelioma, with tremendous proliferation of stratified squamous epithelium, with a transformation of the superficial layer into keratin, and a tendency to the formation of epithelial pearls, while many slender connective-tissues papillae projected up among the epithelial layers from the under-lying tissue.

The author regards it as a case of benign growth becoming suddenly malignant, since it remained quiet for nearly two years, and then suddenly took on malignancy.

Richards.

Laryngeal Stenosis Due to Comminution of the Thyroid Cartilage.

MAYER, EMIL, M. D., New York. *(Journal of the A. M. A.*, Oct. 27, 1900.)

The case is that of a soldier in the Spanish-American war, who was injuried by a Mauser bullet. The bullet entered directly alongside and over the eye. "It then went through the superior maxilla downward and backward, cut through the posterior portion of the soft plate

and entered the neck. Here it became deflected, probably by the hyoid bone, and entered the thyroid cartilage, thoroughly comminuting it, cutting into the esophageal wall, where, being spent, it dropped into the stomach." It later probably passed from the intestines.

He was injured on July 2nd, 1898, and on August 3rd tracheotomy had to be performed on account of the dyspnea. Various attempts were made to pass tubes for dilatation of the larynx, and some air was got through, and by January, he was able to speak in a hoarse but strong voice. There was a tendency to closure, and various attempts were made at intubation with the different kinds and sizes of O'Dwyer and Schrötter tubes.

The author finally had a special tube made, the head of which was as low as possible, with no retaining swell, and with a threaded opening for a screw piece, and a hollow introducer. This tube was introduced and left in position for a while and then removed.

The vocal cords are now visible, and perform their function; and the author expects ultimately a cure. *Richards.*

V.—MISCELLANEOUS.

The Massachusetts State Hospitals for Consumptives at Rutland. Its Purpose and the Work Accomplished During the First Year.

BOWDITCH, VINCENT Y., M. D. (*Boston Med. and Surg. Journal*, February 8, 1900.)

The State Care of Consumptives.

NAMMACK, CHARLES E., M. D., New York. (*Philadelphia Med. Journal*, February 17, 1900.)

The Sanitarium Treatment of Incipient Pulmonary Tuberculosis and Its Results.

TRUDEAU, E. L., M. D. (*Medical News*, Jan. 2, 1900.)

Especial Hospitals for Consumption Among the Poor in Our Cities.

OTIS, EDWARD O., M. D., Boston. (*Philadelphia Med. Journal*, June 30, 1900.)

Some of the European Sanatoria for Consumptives, and the Final Aims of Phthisiotherapy.

FREUDENTHAL, W., M. D., New York. (*Medical News*, February 24, 1900.)

Sanitorium Treatment at Home for Patients Suffering from Tuberculosis.

KNOPF, S. A., M. D., New York. (*Medical Record*, January 27, 1900.)

The Registration of Tuberculosis.

FLICK, LAWRENCE F., M. D., Philadelphia. (*Philadelphia Med. Journal*, June 2, 1900.)

This group of papers by prominent men and in leading journals shows how widespread is the interest in the treatment of tuberculosis. More and more the idea is gaining foothold that the state and the city owe a duty to its tuberculous population, and an endeavor is being made to cure the early cases and make a beginning in the difficult task of stamping out the disease.

Massachusetts is the first of the states to establish a state hospital. This was built in Rutland, Mass., on the southern slope of a hill, at an elevation of about 1200 feet. It is protected on the north by a thick forests of pine. The buildings are arranged as pavilion wards one story high, spreading like the outstretched fingers of the hand toward the south. The patients sleep in open wards as a rule, a few private rooms being provided for severe illness. Sun rooms and piazzas are provided, and caps are made in the neighboring wood. Constant life in the open air is insisted upon, except at the hours of rising and going to bed, (at which times in winter the heat is turned into the wards), the windows are left open during the 24 hours. Sponge or plunge baths at regular intervals; three hearty meals a day, with lunches of eggs and milk or their equivalent; pulmonary gymnastics and fresh air constitute the methods of treatment. Little weight has been given to medicinal measures; nor are serums used, a limited experience having proved disappointing. Only incipient cases are frequently discharged earlier than is desirable, on account of lack of means and the inability of the hospital to care for them a sufficient length of time. The methods taught are pursued at home by the patients, and improvement frequently continues.

One hundred and fifteen patients were discharged, and of this number 35 were classed as "arrested", 37 as "much improved", and 24 as "not improved", and there was one death, the latter from an injury. In the homeopathic di-

vision, of 78 patients discharged, 29 were apparently cured, 25 improved, five became stationary, and 19 were worse. The gain in weight in individual cases was all the way from seven to 44 pounds. With more careful selection of cases, the results promise to be even better. There are accommodations for 180 patients, and $4.00 per week is charged; the actual cost to the state was $8.40 per week; it is thought that this cost will be less in the future.

Dr. C. E. Nammack urges the establishment of state hospitals, and says that every state in the Union, almost without exception, has some place within its borders where a pure, dry atmosphere, and some elevation with protection from winds can be obtained. He thinks that 50 per cent of the cases admitted as incipient can be cured and returned to the community as workers. He thinks that the state should also provide for the advanced and incurable cases as well.

Dr. Trudeau has found in his institution at Saranac Lake that 68 per cent of the incipient cases were discharged as well, while only 11 per cent of the advanced, and none of the far advanced cases recovered. He believes that activity of a part affected with tuberculosis always tends to aggravate the disease, and render it progressive.

He has found absolute rest in the open air to reduce the pyrexia, conserve the patient's energies, and abort the activity of the tuberculous process, without disturbing the digestion. On the other hand, Freudenthal does not approve of the rest cure methods, the inactive life, and says, "I wish to emphasize my conviction that instead of the rest cure I am in favor of a working cure." Light out of door work under supervision, he regards as advisable; the absolute rest cure is apt to bring on neurasthenia from inaction of muscles that normally should be at work.

Trudeau has found tuberculin in early suitable cases apparently free from danger, and having some favorable influence in bringing about the formation of fibrous tissue.

Otis thinks it is the duty of every city to provide for the care of the poor consumptive as much as it is to care for the injured and sick poor, suffering from other diseases. When the public is better educated as regards the dangers to others from the consumptive and his sputum, these

hospitals will come. They are needed for prophylaxis and philanthropic reasons. Under good hospital care, many, even the apparently hopeless cases recover sufficiently to resume work. Up to the present time, public opinion has been apathetic upon the matter.

Dr. Knopf gives detailed directions as to the daily life of the tuberculous patient in the home, his general hygiene, diet, and open air treatment. He takes a somewhat middle ground as to the rest cure. A lasting temperature of over 100° F. is an absolute contra-indication to exercise.

Flick argues in favor of the registration of tuberculosis, in order that contact may be controlled, fomites prevented, sterilized, and that innocent parties may be enabled to protect themselves against contamination in dwelling houses. He has found from his own investigations that many cases of tuberculosis are undoubtedty contracted in contaminated houses, and this mode of distributing the disease can only be prevented by registration. Contrary to the long held ideas of heredity he says, "In all probability tuberculosis in the parent tends to produce immunity in the offspring." *Richards.*

Transmission of Tuberculosis Through the Meat and Milk Supply.

REPP, JOHN J, M. D., Ames, Iowa. *(Philadelphia Med. Journal.)* The meat and milk of certain tuberculous animals contain living, virulent tubercle bacilli. The tubercle bacilli of cattle are pathogenic for man. The meat and milk of certain tuberculous animals is capable of producing tuberculosis in human beings who use these products as food. The meat of all food animals is unfit for food when highly tuberculous, but is safe for food when the animal is only slightly tuberculous if the meat is well cooked and all tuberculous tissue is eliminated. The milk of a cow with a tuberculous udder is always dongerous for food unless well sterilized. The milk of a tuberculous cow without disease of the udder should always be looked upon with suspicion, and either not used, or used only after sterilization. *Richards.*

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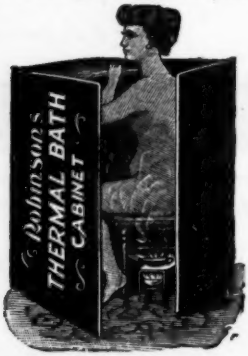

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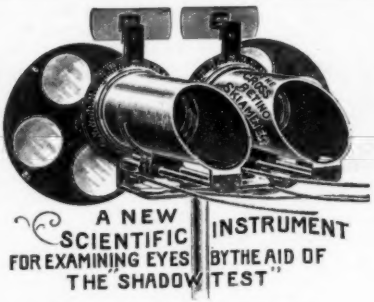

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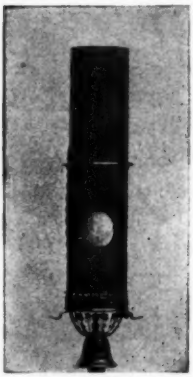

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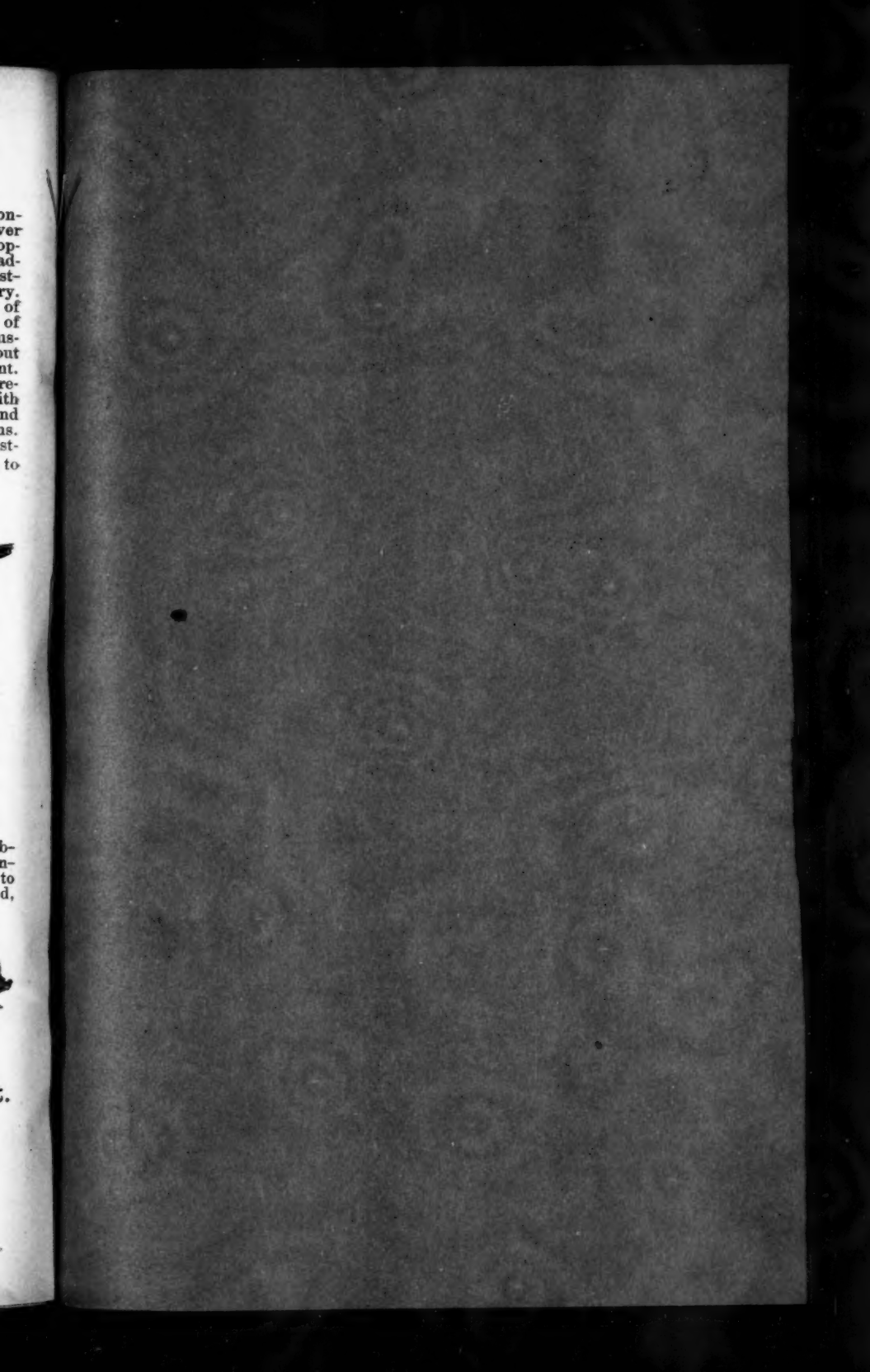
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